```
1           .REM    !
2
3
4
5
6
7
8
9
10
11
12
13
14
15                      IDENTIFICATION
16
17
18                  PRODUCT CODE:           AC-8198C-MC
19
20                  PRODUCT NAME:           CVKADCO 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.
```

```
                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.
```

```
162
163
164             6.      ERRORS
165
166             6.1     ALL ERRORS WILL CAUSE A HALT.
167                     THE PC+2 OF THE HALT INSTRUCTION IS PRINTED
168                     ON THE CONSOLE DEVICE BY THE LSI-11'S U-ODT.
169
170             6.1.1   THE PROGRAM CHECKS TO SEE THAT THE P.C. DOESN'T JUMP
171                     WITHIN THE TESTS, BY A SEQUENCE COUNT CALLED '$TSTN'
172                     THIS TEST IS A SEQUENTIAL INCREMENT AND COMPARE COUNT.
173
174                     EX:     CODE
175
176                     INC     @#$TESTN        ;UPDATE TEST NUMBER
177                     CMP     #N,@#$TESTN     ;SEQUENCE ERROR?
178                     BNE     SOME LOCATION   ;BRANCH TO ERROR HALT ON SEQ ERROR
179                     IMPORTANT
180             ****************************
181
182                     IF AN ERROR IS DETECTED ;IT COULD BE BECAUSE OF TWO REASONS.
183                     A)      WRONG TEST NUMBER
184                     B)      ERROR IN THE PRESENT TEST.
185
186                     ////////////////////////////////////////////////////////
187                     THE TEST SEQUENCE LOCATION 'TESTN' SHOULD BE CHECKED FIRST
188                     TO SEE IF IT MATCHES THE PRESENT TEST.
189                     IF IT DOESN'T MATCH ; THEN THE CONTENTS OF THIS LOCATION
190                     TELL YOU WHICH TEST IT WAS DOING BEFORE IT HALTED.
191                     ////////////////////////////////////////////////////////
192
193
194             6.2     ERROR RECOVERY
195                     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
```

SEQ 0007

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

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


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

```
                                        .=400
                                .SBTTL  ACT11 HOOKS

                                ;*****************************************************************************
                                ;HOOKS REQUIRED BY ACT11
                                        $SVPC=.                 ;SAVE PC
                                        .=46
                                        $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                                        .=52
                                        .WORD   0               ;;2)SET LOC.52 TO ZERO
                                        .=$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$:     MOV     #123456,K5
001216 012767 050505 177354             MOV     #050505,K1
001224 012705 000600                    MOV     #K1,%5          ;%5(050505)K1
001230 012706 000612                    MOV     #K6,%6          ;%6(123456)K5
001234 114625                           MOVB    -(6),(5)+       ;LOW .BYTE OF R6 TO R5 (DECREMENT)
001236 026727 177336 050456             CMP     K1,#050456
001244 001405                           BEQ     2$
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,@#$FATAL    ;MOVE TO MAILBOX #  *******  22  *******
001612  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001614  000000                        HALT                    ;ODD TO ODD FAILED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 72?
001616  126767  176774  176773  4$:   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
```

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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     @#$TESTN        ;UPDATE TEST NUMBER
002116  022737  000005  000404        CMP     #5,@#$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
```

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.MAIN.  MACY11 30A(1052)  18-SEP-78  12:00  PAGE 21
VKAD'.MAC    18-SEP-78 1'·54          T6      DECREMENT OF STACK POINTER ON A TRAP OPERATION

 715
 716                                    ;*****************************************************************************
 717                                    ;TEST 7 THAT PROPER P.C. IS SAVED
 718                                    ;*****************************************************************************
 719  002224  005237  000404            TST7:   IN      @#$TESTN        ;UPDATE TEST NUMBER
 720  002230  022737  000007  000404            CMP     #7,@#$TESTN     ;SEQUENCE ERROR?
 721  002236  001012                            BNE     TST10-12        ;BR TO ERROR HALT ON SEQ ERROR
 722  002240  012706  000500                    MOV     #BUFF,SP        ;STACK POINTER SETUP
 723  002244  012767  002254  175536            MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
 724  002252  000007                    INSTC:  TRAPA                   ;TRAP ON THIS INSTRUCTION
 725  002254  022767  002254  176212    RETC:   CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
 726  002262  001405                            BEQ     TST10
 727  002264  012737  000040  000402            MOV     #40,@#$FATAL    ;MOVE TO MAILBOX #  *******  40  *******
 728  002272  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 729  002274  000000                            HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
 730                                                                    ; TO SCOPE REPLACE HALT W/ 240
 731                                                                    ; AND REPLACE NEXT INST W/ 760
 732                                    ;*****************************************************************************
 733                                    ;TEST 10 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
 734                                    ;*****************************************************************************
 735  002276  005237  000404            TST10:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 736  002302  022737  000010  000404            CMP     #10,@#$TESTN    ;SEQUENCE ERROR?
 737  002310  001044                            BNE     TST11-12        ;BR TO ERROR HALT ON SEQ ERROR
 738  002312  012706  000500                    MOV     #BUFF,SP        ;SET UP
 739  002316  012767  002340  175464            MOV     #RETD,RTRAP     ;SET UP
 740  002324  005067  010756                    CLR     STATUS          ;CLEAR STATUS AND PRIORITY
 741  002330  106467  010752                    MTPS    STATUS
 742  002334  000257                            CCC
 743  002336  000007                            TRAPA                   ;TRAP
 744  002340  026727  176132  000000    RETD:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
 745  002346  001405                            BEQ     1$
 746  002350  012737  000041  000402            MOV     #41,@#$FATAL    ;MOVE TO MAILBOX #  *******  41  *******
 747  002356  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 748  002360  000000                            HALT                    ;INCORRECT STATUS
 749                                                                    ; TO SCOPE REPLACE HALT W/ 240
 750                                                                    ; AND REPLACE NEXT INST W/ 753
 751  002362  012706  000500            1$:     MOV     #BUFF,SP        ;SET UP
 752  002366  012767  002412  175414            MOV     #RETE,RTRAP     ;SET UP
 753  002374  012767  000357  010704            MOV     #357,STATUS     ;SET PRIORITY
 754  002402  106467  010700                    MTPS    STATUS
 755  002406  000277                            SCC                     ;SET STATUS
 756  002410  000007                            TRAPA                   ;TRAP
 757  002412  026727  176060  000357    RETE:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
 758  002420  001405                            BEQ     TST11
 759  002422  012737  000042  000402            MOV     #42,@#$FATAL    ;MOVE TO MAILBOX #  *******  42  *******
 760  002430  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 761  002432  000000                            HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
 762                                                                    ; TO SCOPE REPLACE HALT W/ 240
 763                                                                    ; AND REPLACE NEXT INST W/ 726
```

```
                                        ;*****************************************************************************
                                        ;TEST 11 THAT 'NEW'' STATUS IS CORRECT
                                        ;*****************************************************************************
002434  005257  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,@#$FATAL    ;MOVE TO MAILBOX #  *******  47  *******
002572  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002574  000000                        HALT                    ;PRIORITY NOT ZERO
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 724
002576  012706  000500          5$:     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
```

```
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 705
003466                                  1$:
003466  001405                          BEQ     2$
003470  012737  000070  000402          MOV     #70,@#$FATAL    ;MOVE TO MAILBOX #  *******  70  *******
003476  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003500  000000                          HALT                    ;Z NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 677
003502                                  2$:
003502  102405                          BVS     3$
003504  012737  000071  000402          MOV     #71,@#$FATAL    ;MOVE TO MAILBOX #  *******  71  *******
003512  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003514  000000                          HALT                    ;V NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 671
003516                                  3$:
003516  103405                          BCS     4$
003520  012737  000072  000402          MOV     #72,@#$FATAL    ;MOVE TO MAILBOX #  *******  72  *******
003526  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003530  000000                          HALT                    ;C NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 663
003532  106767  007550          4$:     MFPS    STATUS
003536  016706  007544                  MOV     STATUS,SP
003542  042706  000017                  BIC     #17,SP
003546  022706  000340                  CMP     #340,SP
003552  001405                          BEQ     TST17
003554  012737  000073  000402          MOV     #73,@#$FATAL    ;MOVE TO MAILBOX #  *******  73  *******
003562  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003564  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; 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                   RB':    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
```

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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
```

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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                  MFPS    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
```

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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
```

```

                                        ;*******************************************************************************
                                        ;TEST 42 THAT PROPER P.C. IS SAVED
                                        ;*******************************************************************************
006406  005237  000404                  TST42:  INC     @#$TESTN                ;UPDATE TEST NUMBER
006412  022737  000042  000404                  CMP     #42,@#$TESTN            ;SEQUENCE ERROR?
006420  001012                                  BNE     TST43-12                ;BR TO ERROR HALT ON SEQ ERROR
006422  012706  000500                          MOV     #BUFF,SP                ;STACK POINTER SETUP
006426  012767  006436  171350                  MOV     #RETC5,RTRAP5           ;RETURN FROM TRAP POINTER
006434  000100                                  JMP     %0                      ;TRAP ON THIS INSTRUCTION
006436  022767  006436  172030          RETC5:  CMP     #.,BUFF-4               ;CHECK FOR INCREMENTED P.C.
006444  001405                                  BEQ     TST43
006446  012737  000155  000402                  MOV     #155,@#$FATAL           ;MOVE TO MAILBOX #  *******  155  *******
006454  005212                                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
006456  000000                                  HALT                            ;INCORRECT P.C.,OR WRONG $TESTN
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 760
                                        ;*******************************************************************************
                                        ;TEST 43 THAT "OLD" STATUS AND PRIORITY ARE PLACED ON STACK
                                        ;*******************************************************************************
006460  005237  000404                  TST43:  INC     @#$TESTN                ;UPDATE TEST NUMBER
006464  022737  000043  000404                  CMP     #43,@#$TESTN            ;SEQUENCE ERROR?
006472  001044                                  BNE     TST44-12                ;BR TO ERROR HALT ON SEQ ERROR
006474  012706  000500                          MOV     #BUFF,SP                ;SET UP
006500  012767  006522  171276                  MOV     #RETD5,RTRAP5           ;SET UP
006506  005067  004574                          CLR     STATUS                  ;CLEAR STATUS AND PRIORITY
006512  106467  004570                          MTPS    STATUS
006516  000257                                  CCC
006520  000100                                  JMP     %0                      ;TRAP
006522  026727  171750  000000          RETD5:  CMP     BUFF-2,#0               ;TEST THAT OLD STATUS WENT TO STACK
006530  001405                                  BEQ     1$
006532  012737  000156  000402                  MOV     #156,@#$FATAL           ;MOVE TO MAILBOX #  *******  156  *******
006540  005212                                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
006542  000000                                  HALT                            ;INCORRECT STATUS
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 753
006544  012706  000500                  1$:     MOV     #BUFF,SP                ;SET UP
006550  012767  006574  171226                  MOV     #RETE5,RTRAP5           ;SET UP
006556  012767  000357  004522                  MOV     #357,STATUS                     ;SET PRIORITY
006564  106467  004516                          MTPS    STATUS
006570  000277                                  SCC                             ;SET CC
006572  000100                                  JMP     %0                      ;TRAP
006574  026727  171676  000357          RETE5:  CMP     BUFF-2,#357             ;COMPARES STATUS ON STACK
006602  001405                                  BEQ     TST44
006604  012737  000157  000402                  MOV     #157,@#$FATAL           ;MOVE TO MAILBOX #  *******  157  *******
006612  005212                                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
006614  000000                                  HALT                            ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 726
```

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1672
1673                                    ;*****************************************************************************
1674                                    ;TEST 44 THAT "NEW" STATUS IS CORRECT
1675                                    ;*****************************************************************************
1676  006616  005237  000404           TST44:  INC     @#$TESTN        ;UPDATE TEST NUMBER
1677  006622  022737  000044  000404           CMP     #44,@#$TESTN    ;SEQUENCE ERROR?
1678  006630  001123                           BNE     TST45-12        ;BR TO ERROR HALT ON SEQ ERROR
1679  006632  012706  000500                   MOV     #BUFF,SP
1680  006636  012767  006652  171140           MOV     #RETF5,RTRAP5
1681  006644  005067  171136                   CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
1682  006650  000100                           JMP     %0
1683  006652                           RETF5:
1684  006652  100005                           BPL     1$
1685  006654  012737  000160  000402           MOV     #160,@#$FATAL   ;MOVE TO MAILBOX #  *******  160  *******
1686  006662  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1687  006664  000000                           HALT                    ;C NOT CLEARED
1688                                                                   ; TO SCOPE REPLACE HALT W/ 240
1689                                                                   ; AND REPLACE NEXT INST W/ 761
1690  006666                           1$:
1691  006666  001005                           BNE     2$
1692  006670  012737  000161  000402           MOV     #161,@#$FATAL   ;MOVE TO MAILBOX #  *******  161  *******
1693  006676  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1694  006700  000000                           HALT                    ;Z NOT CLEARED
1695                                                                   ; TO SCOPE REPLACE HALT W/ 240
1696                                                                   ; AND REPLACE NEXT INST W/ 753
1697  006702                           2$:
1698  006702  102005                           BVC     3$
1699  006704  012737  000162  000402           MOV     #162,@#$FATAL   ;MOVE TO MAILBOX #  *******  162  *******
1700  006712  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1701  006714  000000                           HALT                    ;V NOT CLEARED
1702                                                                   ; TO SCOPE REPLACE HALT W/ 240
1703                                                                   ; AND REPLACE NEXT INST W/ 745
1704  006716                           3$:
1705  006716  103005                           BCC     4$
1706  006720  012737  000163  000402           MOV     #163,@#$FATAL   ;MOVE TO MAILBOX #  *******  163  *******
1707  006726  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1708  006730  000000                           HALT                    ;C NOT CLEARED
1709                                                                   ; TO SCOPE REPLACE HALT W/ 240
1710                                                                   ; AND REPLACE NEXT INST W/ 737
1711  006732  106767  004350           4$:     MFPS    STATUS
1712  006736  032767  000357  004342           BIT     #357,STATUS             ;TEST PRIORITY
1713  006744  001405                           BEQ     5$
1714  006746  012737  000164  000402           MOV     #164,@#$FATAL   ;MOVE TO MAILBOX #  *******  164  *******
1715  006754  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1716  006756  000000                           HALT                    ;PRIORITY NOT ZERO
1717                                                                   ; TO SCOPE REPLACE HALT W/ 240
1718                                                                   ; AND REPLACE NEXT INST W/ 724
1719  006760  012706  000500           5$:     MOV     #BUFF,SP
1720  006764  012767  007002  171012           MOV     #RETG5,RTRAP5
1721  006772  012767  000357  171006           MOV     #357,RTRAP5+2   ;SET NEW "CC" AND PRIORITY
1722  007000  000100                           JMP     %0              ;TRAP HERE
1723  007002                           RETG5:
1724  007002  100405                           BMI     1$
1725  007004  012737  000165  000402           MOV     #165,@#$FATAL   ;MOVE TO MAILBOX #  *******  165  *******
1726  007012  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1727  007014  000000                           HALT                    ;N NOT SET
```

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1728                                                    ; TO SCOPE REPLACE HALT W/ 240
1729                                                    ; AND REPLACE NEXT INST W/ 705
1730  007016                                    1$:
1731  007016  001405                           BEQ     2$
1732  007020  012737  000166  000402          MOV     #166,@#$FATAL   ;MOVE TO MAILBOX #  *******  166  *******
1733  007026  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1734  007030  000000                           HALT                    ;Z NOT SET
1735                                                    ; TO SCOPE REPLACE HALT W/ 240
1736                                                    ; AND REPLACE NEXT INST W/ 677
1737  007032                                    2$:
1738  007032  102405                           BVS     3$
1739  007034  012737  000167  000402          MOV     #167,@#$FATAL   ;MOVE TO MAILBOX #  *******  167  *******
1740  007042  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1741  007044  000000                           HALT                    ;V NOT SET
1742                                                    ; TO SCOPE REPLACE HALT W/ 240
1743                                                    ; AND REPLACE NEXT INST W/ 671
1744  007046                                    3$:
1745  007046  103405                           BCS     4$
1746  007050  012737  000170  000402          MOV     #170,@#$FATAL   ;MOVE TO MAILBOX #  *******  170  *******
1747  007056  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1748  007060  000000                           HALT                    ;C NOT SET
1749                                                    ; TO SCOPE REPLACE HALT W/ 240
1750                                                    ; AND REPLACE NEXT INST W/ 663
1751  007062  106767  004220           4$:     MFPS    STATUS
1752  007066  016706  004214                   MOV     STATUS,SP
1753  007072  022706  000357                   CMP     #357,SP
1754  007076  001405                           BEQ     TST45
1755  007100  012737  000171  000402          MOV     #171,@#$FATAL   ;MOVE TO MAILBOX #  *******  171  *******
1756  007106  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
1757  007110  000000                           HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
1758                                                    ; TO SCOPE REPLACE HALT W/ 240
1759                                                    ; 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
```

```
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 $TESTN
1807                                                                   ; TO SCOPE REPLACE HALT W/ 240
1808                                                                   ; AND REPLACE NEXT INST W/ 760
1809
1810                                    ;*****************************************************************************
1811                                    ;TEST 50 THAT 'OLD' STATUS AND PRIORITY ARE PLACED ON STACK
1812                                    ;*****************************************************************************
1813  007276  005237  000404            TST50:  INC     @#$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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.MAIN.  MACY11 30A(1052)  18-SEP-78  12:00  PAGE 47
CVKADC.MAC    18-SEP-78 11:54          T51     THAT 'NEW' STATUS IS CORRECT                                    SEQ 0047

 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
```

```

                                        ;*****************************************************************************
                                        ;TEST 60 TRAP ON TRAP
                                        ;*****************************************************************************
010456  005237  000404                  TST60:  INC     @#$TESTN        ;UPDATE TEST NUMBER
010462  022737  000060  000404                  CMP     #60,@#$TESTN    ;SEQUENCE ERROR?
010470  001033                                  BNE     TRACE           ;BR TO ERROR HALT ON SEQ ERROR
                                        ;TEST THAT TRACE BIT TRAPS ARE INHIBITED ON TRAP INST

010472  012705  177777                          MOV     #177777,%5
010476  012706  000500                  TRPTRP: MOV     #BUFF,%6
010502  012767  010554  167304                  MOV     #TRACE1,14      ;TRACE TRAP
010510  005027  000016                          CLR     #16             ;
010514  005027  000022                          CLR     #22
010520  012767  010572  167272                  MOV     #TONT1,20       ;IOT TRAP
010526  012746  000020                          MOV     #20,-(SP)       ;PUSH T BIT
010532  012746  010540                          MOV     #.+6,-(SP)      ;PUSH PC
010536  000006                                  RTT                     ;SET T BIT
010540  000004                                  IOT                     ;TRAP, NEW STATUS HAVE TRACE RESET
010542  012737  000222  000402                  MOV     #222,@#$FATAL   ;MOVE TO MAILBOX #  *******  222  *******
010550  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010552  000000                                  HALT                    ;NO TRAP OCCURRED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 746
010554  005205                          TRACE1: INC     %5      ;IF FAILED TRY THIS TEST TWICE BUT NO MORE
010556  001747                                  BEQ     TRPTRP
010560                                  TRACE:
010560  012737  000223  000402                  MOV     #223,@#$FATAL   ;MOVE TO MAILBOX #  *******  223  *******
010566  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010570  000000                                  HALT                    ;IOT SHOULD HAVE CLEARED THE T BIT,OR WRONG $TESTN
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 737
010572  012767  000016  167214          TONT1:  MOV     #16,14
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
```

```
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
```

```
                                        T65     THAT 'RESET' GOES TO OUTSIDE WORLD                                      SEQ 0058

 2264
 2265                                   ;*************************************************************************
 2266                                   ;TEST 66 THAT RESET HAS NO EFFECT ON THE TRACE TRAP
 2267                                   ;*************************************************************************
 2268  011464  005257  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
```

```
                                ;*****************************************************************************
                                ;TEST 67 THAT WHEN TTY INTERRUPTS IT POPS NEW STATUS
                                ;*****************************************************************************
011564  005237  000404          TST67:  INC     @#$TESTN        ;UPDATE TEST NUMBER
011570  022737  000067  000404          CMP     #67,@#$TESTN    ;SEQUENCE ERROR?
011576  001103                        BNE     RSTP4           ;BR TO ERROR HALT ON SEQ ERROR
011600  032767  000001  166612        BIT     #1,$ENV         ; CHECK IF ON APT
011606  001403                        BEQ     NOAPT2          ; IF NOT ON APT
011610  005767  166572                TST     $PASS           ;CHECK IF FIRST PASS
011614  001106                        BNE     TST70           ; IF NOT
011616                          NOAPT2:
011616  000005                        RESET
011620  012704  000012                MOV     #12,R4          ;DELAY AFTER THE RESET IN CASE ON PDT-11 TO
011624  077401                        SOB     R4,.            ;ALLOW 8085 TO BE READY FOR I/O PAGE REFERENCE
011626  012706  000500                MOV     #BUFF,%6        ;SET UP STACK
011632  012767  011700  166224        MOV     #TTY3,64        ;INTERRUPT VECTOR
011640  106427  000000                MTPS    #0
011644  012767  000357  166214        MOV     #357,66         ;HIGH PRIORITY ON INTERRUPT
011652  052767  000100  165704        BIS     #100,TTCSR      ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
011660  012704  000120                MOV     #120,R4         ;SET UP DELAY IN CASE ON PDT-11 (IT TAKES LONG
011664  077401                        SOB     R4,.            ;TIME FOR INTERRUPT REQUEST TO BE SEEN BY CPU)
011666  012737  000235  000402        MOV     #235,@#$FATAL   ;MOVE TO MAILBOX #  *******  235  *******
011674  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
011676  000000                        HALT                    ;NO INTERRUPT
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 737
011700  106767  001402          TTY3:   MFPS    STATUS
011704  022767  000357  001374        CMP     #357,STATUS
011712  001405                        BEQ     1$
011714  012737  000236  000402        MOV     #236,@#$FATAL   ;MOVE TO MAILBOX #  *******  236  *******
011722  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
011724  000000                        HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 724
011726  000005                  1$:   RESET                   ;CLR NTERRUPT ENABLE
011730  012704  000012                MOV     #12,R4          ;DELAY AFTER THE RESET IN CASE ON PDT-11 TO
011734  077401                        SOB     R4,.            ;ALLOW 8085 TO BE READY FOR I/O PAGE REFERENCE
011736  012706  000500                MOV     #BUFF,%6        ;STACK SET UP
011742  012767  011774  166114        MOV     #TTY4,64        ;INTERRUPT VECTOR
011750  005067  166112                CLR     66              ;CLR NEW STATUS
011754  106427  000017                MTPS    #17
011760  052767  000100  165576        BIS     #100,TTCSR      ;SET INTERRUPT ENABLE
011766  012704  000120                MOV     #120,R4         ;SET UP DELAY IN CASE ON PDT-11
011772  077401                        SOB     R4,.            ;WAIT FOR TTY INTERRUPT REQUEST TO GET THRU TO CPU (ON T
011774  106767  001306          TTY4:   MFPS    STATUS
012000  005767  001302                TST     STATUS
012004  001405                        BEQ     RST4
012006                          RSTP4:
012006  012737  000237  000402        MOV     #237,@#$FATAL   ;MOVE TO MAILBOX #  *******  237  *******
012014  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012016  000000                        HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 667
012020  005067  165540          RST4:   CLR     TTCSR
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  0 2046  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$:     CLR     R0
2368  012074  005067  165706                   CLR     6
2369  012100  012767  012222  165676           MOV     #ATRAP,4        ;SET UP ADDRESS TRAP ENTRANCE
2370  012106  012706  000500                   MOV     #BUFF,SP
2371  012112  105720                  NOR:    TSTB    (0)+            ;IF OUTSIDE OF CORE, TRAP TO 4
2372  012114  020027                          CMP     R0,(PC)+        ;IS POINTER INSIDE 28K (30K) CORE
2373  012116  160000                  HICORE: .WORD   160000          ;MAY BE CHANGED TO 170000 IF 30K
2374  012120  103774                          BLO     NOR             ;TEST THE REST OF CORE
2375  012122  013737  012116  012266           MOV     @#HICORE,@#CORH ;FOR USE BY END OF PASS CHECKER IF ON TIM
2376  012130  012737  012154  000004           MOV     #R0TRAP,@#4     ;SET UP NEW VECTOR POINTER
2377  012136  105737  177700                   TSTB    @#177700        ;CHECK R0 UNIBUS ADDRESS--SHOULD TRAP ON LSI
2378  012142                          TRPADR:
2379  012142  012737  000240  000402           MOV     #240,@#$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          R0TRAP: 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,@#$FATAL   ;MOVE TO MAILBOX #  *******  242  *******
2397  012216  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
2398  012220  000000                          HALT                    ;OLD PC WAS NOT SAVED
2399                                                                  ; TO SCOPE REPLACE HALT W/ 240
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                                                                ; AND REPLACE NEXT INST W/ 711
                                ;RETURN HERE ON AN ADDRESS TRAP FROM MEMORY BELOW 28K (OR 30K)
012222  005300          ATRAP:  DEC     R0
012224  010067  000036          MOV     R0,CORH         ;MOVE THE FIRST NXM LOCATION IN CORH
                                ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTANT MEMORY LOCATION
012230  013700  012116          MOV     @#HICORE,R0     ;SET UP THE HIGHEST MEM LOCATION
012234  005300                  DEC     R0              ;MAKE 1 LESS THAN THE HIGHEST CORE BOUNDARY
012236  000402                  BR      NOSUB           ;DON'T SUBTRACT 1K FIRST TIME
012240  162700  001000  CTRAP:  SUB     #1000,R0        ;SUBTRACT 1K OCTAL BYTE FROM ADDRESS BECAUSE
                                                        ;IT TAKES FOREVER TO GET TIMEOUT ON TIM
012244  012767  012304  165532 NOSUB:  MOV     #BTRAP,4        ;SET UP THE VECTOR
012252  012706  000500          MOV     #BUFF,SP
012256  011005                  MOV     (R0),R5         ;SAVE THE WORD IF IT IS THERE--TRAP IF NOT
012260  005010          DTRAP1: CLR     (R0)            ;IT WAS THERE--TRAP IF IT IS ROM
012262  010510          DTRAP2: MOV     R5,(R0)         ;NOT ROM--RESTORE WORD
012264  020027                  CMP     R0,(PC)+        ;DO LOCATIONS MATCH?
012266  000000          CORH:   .WORD   0
012270  101434                  BLOS    TRAPB
012272  012737  000243  000402          MOV     #243,@#$FATAL   ;MOVE TO MAILBOX #  *******  243  *******
012300  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012302  000000                  HALT                    ;CONTENTS OF R0 SHOULD HAVE BEEN LESS THAN OR EQUAL TO (
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 660
                                                        ;IF THIS COMPARISON FAILS IT MEANS
                                                        ;THAT SOME LEGAL ADDRESS TRAPPED OR
                                                        ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
012304  106767  000776  BTRAP:  MFPS    STATUS
012310  005767  000772          TST     STATUS
012314  001405                  BEQ     1$
012316  012737  000244  000402          MOV     #244,@#$FATAL   ;MOVE TO MAILBOX #  *******  244  *******
012324  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012326  000000                  HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 646
012330  026727  166140  012260 1$:     CMP     BUFF-4,#DTRAP1
012336  001740                  BEQ     CTRAP           ;BRANCH IF TRAP PC IS OK
012340  026727  166130  012262          CMP     BUFF-4,#DTRAP2  ;CHECK IF IT TRAPPED ON THE CLR INSTR
012346  001734                  BEQ     CTRAP
012350                  AUTO1:
012350  012737  000245  000402          MOV     #245,@#$FATAL   ;MOVE TO MAILBOX #  *******  245  *******
012356  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012360  000000                  HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 631
012362  012767  000006  165414 TRAPB:  MOV     #6,4
012370  005067  165412          CLR     6
```

```
                                                ;**********************************************************************
                                                ;TEST 71 THE 'WAIT' INSTRUCTION
                                                ;**********************************************************************
012374  005237  000404          TST71:  INC     @#$TESTN        ;UPDATE TEST NUMBER
012400  022737  000071  000404          CMP     #71,@#$TESTN    ;SEQUENCE ERROR?
012406  001070                          BNE     REES1           ;BR TO ERROR HALT ON SEQ ERROR
012410  032767  000001  166002          BIT     #1,$ENV ;CHECK IF ON APT
012416  001403                          BEQ     NOAPT3          ;BR, IF NOT ON APT
012420  005767  165762                  TST     $PASS           ;CHECK IF FIRST PASS
012424  001066                          BNE     REES            ;BR, IF NOT
012426  042767  000100  165130  NOAPT3: BIC     #100,TPS        ;CLEAR INTERRUPT ENABLE
012434  012706  000500                  MOV     #BUFF,SP        ;SET UP THE STACK
012440  012767  012534  165416          MOV     #WATE,64        ;SET UP THE INTERRUPT VECTOR
012446  005067  165414                  CLR     66
012452  105767  165106          WATE1:  TSTB    TPS             ;WAIT FOR READY
012456  100375                          BPL     WATE1           ;TO BE UP
012460  012767  000015  165100          MOV     #15,TPB         ;DO A CARRIAGE RETURN
012466  105767  165072          WATE2:  TSTB    TPS             ;WAIT FOR READY TO COME UP
012472  100375                          BPL     WATE2
012474  012767  000015  165064          MOV     #15,TPB         ;DO ANOTHER CARRIAGE RETURN
012502  052767  000100  165054          BIS     #100,TPS        ;SET THE INTERRUPT ENABLE
012510  005067  000572                  CLR     STATUS          ;CLEAR THE PSW
012514  106467  000566                  MTPS    STATUS
012520  000001                  WATE3:  WAIT                    ;WAIT FOR THE INTERRUPT
012522  012737  000246  000402          MOV     #246,@#$FATAL   ;MOVE TO MAILBOX #  *******  246  *******
012530  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012532  000000                          HALT                    ;WAIT INSTRUCTION DID NOT LOOP
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 725
012534  106767  000546          WATE:   MFPS    STATUS
012540  005767  000542                  TST     STATUS          ;IS THE PSW CORRECT?
012544  001405                          BEQ     1$
012546  012737  000247  000402          MOV     #247,@#$FATAL   ;MOVE TO MAILBOX #  *******  247  *******
012554  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012556  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 713
012560  026727  165710  012522  1$:     CMP     BUFF-4,#WATE3+2 ;IS THE OLD PC SAVED
012566  001405                          BEQ     REES
012570                          REES1:
012570  012737  000250  000402          MOV     #250,@#$FATAL   ;MOVE TO MAILBOX #  *******  250  *******
012576  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012600  000000                          HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 702
012602  042767  000100  164754  REES:   BIC     #100,TPS        ;CLEAR THE INTERRUPT ENABLE
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 1E 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
```

```
2648
2649                                    ;*****************************************************************************
2650                                    ;SIZE ROUTINE
2651                                    ;*****************************************************************************
2652
2653  013430  010246                   SIZE:   MOV     R2,-(SP)        ;SAVE R2
2654  013432  010446                           MOV     R4,-(SP)        ;SAVE R4
2655  013434  004567  000212                   JSR     R5,TYPE         ;TYPE 'EIS/FIS OPTION ''
2656  013440  014062                             FISOPT
2657  013442  012702  013652                   MOV     #FSTACK,R2      ;SET UP FLOATING POINT STACK
2658  013446  005042                           CLR     -(R2)
2659  013450  005042                           CLR     -(R2)
2660  013452  005042                           CLR     -(R2)
2661  013454  005042                           CLR     -(R2)
2662  013456  012737  013504  000010          MOV     #1$,@#10        ;SET UP RESERVED INSTRUCTION VECTOR
2663  013464  075002                           FADD    R2              ;EXECUTE FLOATING INSTR (0+0)
2664  013466  012737  000012  000010          MOV     #12,@#10        ;RESTORE VECTOR
2665  013474  052767  000300  164724          BIS     #300,$CPUOP     ;FLAG OPTION PRESENT
2666  013502  000413                           BR      2$
2667                                    ;TRAP TO HERE IF NO FIS
2668  013504  012737  000012  000010  1$:     MOV     #12,@#10        ;RESTORE VECTOR
2669  013512  062706  000004                   ADD     #4,SP           ;POP TRAP PC/PSW OFF STACK
2670  013516  042767  000300  164702          BIC     #300,$CPUOP     ;FLAG OPTION NOT PRESENT
2671  013524  004567  000122                   JSR     R5,TYPE         ;TYPE 'NOT ''
2672  013530  014104                             NOT
2673  013532  004567  000114          2$:     JSR     R5,TYPE         ;TYPE 'PRESENT<CR>''
2674  013536  014111                             PRESENT
2675
2676  013540  004567  000106                   JSR     R5,TYPE         ;TYPE 'DIBOL INSTRUCTION SET ''
2677  013544  014123                             DISOPT
2678  013546  005002                           CLR     R2              ;SET UP A 0 DEST LENGTH
2679  013550  005004                           CLR     R4              ;HIGH BYTE MUST BE CLEAR
2680  013552  012737  013600  000010          MOV     #3$,@#10        ;SET UP TRAP VECTOR
2681  013560  076030                           MOVC                    ;MOVE CHARACTER INSTRUCTION
2682  013562  012737  000012  000010          MOV     #12,@#10        ;RESTORE VECTOR
2683  013570  052767  000040  164630          BIS     #40,$CPUOP      ;FLAG OPTION PRESENT
2684  013576  000413                           BR      4$
2685                                    ;TRAP HERE IF NO DIS
2686  013600  012737  000012  000010  3$:     MOV     #12,@#10        ;RESTORE VECTOR
2687  013606  042767  000040  164612          BIC     #40,$CPUOP      ;FLAG NO OPTION
2688  013614  062706  000004                   ADD     #4,SP           ;POP TRAP PC/PSW OFF STACK
2689  013620  004567  000026                   JSR     R5,TYPE         ;TYPE 'NOT ''
2690  013624  014104                             NOT
2691  013626  004567  000020          4$:     JSR     R5,TYPE         ;'PRESENT<CR>''
2692  013632  014111                             PRESENT
2693
2694  013634  012604                           MOV     (SP)+,R4        ;RESTORE REGISTERS USED
2695  013636  012602                           MOV     (SP)+,R2
2696  013640  000207                           RTS     PC
2697
2698                                    ;FLOATING POINT STACK FOR FIS
2699  013642  000004                           .BLKW   4
2700  013652                          FSTACK:
```

```
                                        ;*******************************************************************************
                                        ;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            236C    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
ITRAP5= 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#
```

.MAIN. MACY11 30A(1052) 18-SEP-78 12:00 PAGE 74
CVKADC.MAC 18-SEP-78 11:54 CROSS REFERENCE TABLE -- USER SYMBOLS SEQ 0073

```
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*   844
                          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#
```

.MAIN. MACY11 30A(1052) 18-SEP-78 12:00 PAGE 75
CVKADC.MAC 18-SEP-78 11:54 CROSS REFERENCE TABLE -- USER SYMBOLS SEQ 0074

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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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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#
TST70   012032            2298    2358#
TST71   012374            2450#
TST72   012616            2498#
TST73   012652            2513#
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TTY3    011700            2304    2315#
TTY4    011774            2327    2333#
TYPE    013652             358    2632    2655    2671    2673    2676    2689    2691    2705#   2733
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WATE1   012452            2461#   2462
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#
                          1020    1021#   1037    1038#   1056    1057#   1073    1074#   1090    1091#   1109    1110#   1122
                          1123#   1140    1141#   1147    1148#   1154    1155#   1161    1162#   1169    1170#   1180    1181#
                          1187    1188#   1194    1195#   1201    1202#   1212    1213#   1229    1230#   1246    1247#   1262
                          1263#   1282    1283#   1295    1296#   1313    1314#   1320    1321#   1327    1328#   1334    1335#
```

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                    1342    1345#   1353    1354#   1360    1361#   1367    1368#   1374    1375#   1384    1385#   1401
                    1402#   1420    1421#   1438    1439#   1454    1455#   1474    1475#   1487    1488#   1505    1506#
                    1512    1513#   1519    1520#   1526    1527#   1534    1535#   1545    1546#   1552    1553#   1559
                    1560#   1566    1567#   1577    1578#   1601    1602#   1618    1619#   1635    1636#   1654    1655#
                    1667    1668#   1685    1686#   1692    1693#   1699    1700#   1706    1707#   1714    1715#   1725
                    1726#   1732    1733#   1739    1740#   1746    1747#   1755    1756#   1770    1771#   1787    1788#
                    1804    1805#   1824    1825#   1837    1838#   1855    1856#   1862    1863#   1869    1870#   1876
                    1877#   1884    1885#   1895    1896#   1902    1903#   1909    1910#   1916    1917#   1926    1927#
                    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#
                    2152    2153#   2188    2189#   2194    2195#   2226    2227#   2252    2253#   2259    2260#   2279
                    2280#   2310    2311#   2318    2319#   2337    2338#   2379    2380#   2389    2390#   2396    2397#
                    241R    2419#   2429    2430#   2439    2440#   2471    2472#   2479    2480#   2487    2488#   2503
                    2504#   2566    2567#   2573    2574#   2581    2582#
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$ETEND   000450      319#    342
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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*
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                     703     719*    720     735*    736     768*    769     860*    861     875*    876     891*    892
```

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                   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*
                   1596  1610*  1611  1627*  1628  1643*  1644  1676*  1677  1764*  1765  1779*  1780
                   1796*  1797  1813*  1814  1846*  1847  1937*  1938  1955*  1956  1980*  1981  2001*
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                   2499  2513*  2514
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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
                   1274#  1294  1301  1307#  1383  1390  1396#  1411  1417#  1427  1433#  1437  1443
                   1449#  1453  1460  1466#  1486  1493  1499#  1592  1598#  1607  1613#  1617  1624
                   1630#  1634  1640  1646#  1666  1673  1679#  1754  1761  1767#  1776  1782#  1786
                   1793  1799#  1803  1810  1816#  1836  1843  1849#  1934  1940#  1952  1958#  1970
                   1977  1983#  1990  1998  2004#  2012  2021  2027#  2053  2059#  2073  2080  2086#
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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#
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                   1190  1197  1204  1215  1226#  1232  1241#  1249  1257#  1265  1274#  1285  1298
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                   1417#  1423  1433#  1441  1449#  1457  1466#  1477  1490  1499#  1508  1515  1522
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                   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#  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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                    555#  563#  572#  580#  587#  595#  603#  611#  627#  634#  641#  648#  660#
                    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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                   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#
                   2313#  2321#  2340#  2382#  2392#  2399#  2421#  2432#  2442#  2474#  2482#  2490#  2506#
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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#
                1423#   1441#   1457#   1477#   1490#   1508#   1515#   1522#   1529#   1537#   1548#   1555#   1562#
                1569#   1580#   1604#   1621#   1638#   1657#   1670#   1688#   1695#   1702#   1709#   1717#   1728#
                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#
                2313#   2321#   2340#   2382#   2392#   2399#   2421#   2432#   2442#   2474#   2482#   2490#   2506#
                2569#   2576#   2584#
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                  389     396     406     416     427     438     449     460     470     479     489     502     515
                  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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CVKADC.MAC 18-SEP-78 11:54 CROSS REFERENCE TABLE -- MACRO NAMES SEQ 0079

ERROR 234# 392 402 412 423 434 445 456 466 485 498 511 524 537 551
559 568 576 583 591 599 607 623 629 636 643 656 662 669 676
693 709 726 745 758 776 782 789 796 805 816 822 829 836 847
866 882 898 918 930 948 954 961 968 977 988 994 1001 1008 1019
1036 1056 1072 1089 1108 1121 1139 1145 1152 1159 1168 1179 1185 1192 1199
1210 1229 1245 1261 1281 1294 1312 1318 1325 1332 1341 1352 1358 1365 1372
1383 1400 1420 1437 1453 1473 1486 1504 1510 1517 1524 1533 1544 1550 1557
1564 1575 1601 1617 1634 1653 1666 1684 1690 1697 1704 1713 1724 1730 1737
1744 1754 1770 1786 1803 1823 1836 1854 1860 1867 1874 1883 1894 1900 1907
1914 1924 1946 1964 1970 1990 2012 2037 2045 2066 2073 2098 2104 2127 2133
2152 2187 2193 2225 2251 2258 2278 2310 2317 2335 2378 2388 2395 2417 2428
2437 2471 2478 2485 2502 2565 2572 2579

LOOP 234# 396 406 416 427 438 449 460 470 489 502 515 528 541 555
563 572 580 587 595 603 611 627 634 641 648 660 667 674 681
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 1423 1441 1457 1477 1490 1508 1515 1522 1529 1537 1548 1555 1562
1569 1580 1604 1621 1638 1657 1670 1688 1695 1702 1709 1717 1728 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 2313 2321 2340 2382 2392 2399 2421 2432
2442 2474 2482 2490 2506 2569 2576 2584

NWT 234# 383 473 544 614 684 699 716 732 765 857 872 888 905 937
1026 1047 1062 1079 1095 1128 1220 1235 1251 1268 1301 1390 1411 1427 1443
1460 1493 1592 1607 1624 1640 1673 1761 1776 1793 1810 1843 1934 1952 1977
1998 2021 2053 2080 2114 2139 2161 2201 2238 2265 2289 2355 2447 2495 2510

STARS 234# 269 279 323 325 332 383 385 473 475 544 546 614 616 684
686 699 701 716 718 732 734 765 767 857 859 872 874 888 890
905 907 937 939 1026 1028 1047 1049 1062 1064 1079 1081 1095 1097 1128
1130 1220 1222 1235 1237 1251 1253 1268 1270 1301 1303 1390 1392 1411 1413
1427 1429 1443 1445 1460 1462 1493 1495 1592 1594 1607 1609 1624 1626 1640
1642 1673 1675 1761 1763 1776 1778 1793 1795 1810 1812 1843 1845 1934 1936
1952 1954 1977 1979 1998 2000 2021 2023 2053 2055 2080 2082 2114 2116 2139
2141 2161 2163 2201 2203 2238 2240 2265 2267 2289 2291 2355 2357 2447 2449
2495 2497 2510 2512 2649 2651 2701 2703

$$ERCD 234# 393 403 413 424 435 446 457 467 486 499 512 525 538 552
560 569 577 584 592 600 608 624 631 638 645 657 664 671 678
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 1714 1725 1732 1739
1746 1755 1770 1787 1804 1824 1837 1855 1862 1869 1876 1884 1895 1902 1909
1916 1926 1946 1964 1971 1991 2013 2037 2046 2066 2074 2098 2106 2127 2134
2152 2188 2194 2226 2252 2259 2279 2310 2318 2337 2379 2389 2396 2418 2429
2439 2471 2479 2487 2503 2566 2573 2581

$$ERNU 234# 393 403 413 424 435 446 457 467 486 499 512 525 538 552
560 569 577 584 592 600 608 624 631 638 645 657 664 671 678
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

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CVKADC.MAC 18-SEP-78 11:54 CROSS REFERENCE TABLE -- MACRO NAMES SEQ 0080

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          1566    1577    1601    1618    1635    1654    1667    1685    1692    1699    1706    1714    1725    1732    1739
          1746    1755    1770    1787    1804    1824    1837    1855    1862    1869    1876    1884    1895    1902    1909
          1916    1926    1946    1964    1971    1991    2013    2037    2046    2066    2074    2098    2106    2127    2134
          2152    2188    2194    2226    2252    2259    2279    2310    2318    2337    2379    2389    2396    2418    2429
          2439    2471    2479    2487    2503    2566    2573    2581
$$ERRO     234#    466     537     568     607     677     709     726     758     882     898     930    1019    1072    1089
          1121    1245    1261    1294    1383    1437    1453    1486    1617    1634    1666    1754    1786    1803    1836
          1970    1990    2012    2073    2133    2258
$$LOOP     234#    396     406     416     427     438     449     460     470     489     502     515     528     541     555
           563     572     580     587     595     603     611     627     634     641     648     660     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    1423    1441    1457    1477    1490    1508    1515    1522    1529    1537    1548    1555    1562
          1569    1580    1604    1621    1638    1657    1670    1688    1695    1702    1709    1717    1728    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    2313    2321    2340    2382    2392    2399    2421    2432
          2442    2474    2482    2490    2506    2569    2576    2584
$$N        234#    383     473     544     614     684     699     716     732     765     857     872     888     905     937
          1026    1047    1062    1079    1095    1128    1220    1235    1251    1268    1301    1390    1411    1427    1443
          1460    1493    1592    1607    1624    1640    1673    1761    1776    1793    1810    1843    1934    1952    1977
          1998    2021    2053    2080    2114    2139    2161    2201    2238    2265    2289    2355    2447    2495    2510
.$ACT1     264#    267
.$APTB     264#    277
.$APTH     264#    321


. ABS.  014152     000


 ERRORS DETECTED:  0

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 RUN-TIME: 17 11 1 SECONDS
 RUN-TIME RATIO: 126/30=4.1
 CORE USED:  10K  ( 9 PAGES)
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