```
                        .REM    !
```

IDENTIFICATION

PRODUCT CODE: AC-F012A-MC

PRODUCT NAME: CVKALA0 LSI-11 TRAP (30K+FIS)

DATE: AUG. 1978

MAINTAINER: DIAGNOSTIC GROUP

```
48
49                              1.      ABSTRACT
50
51                                      THIS PROGRAM IS A COPY OF CVKADB WITH MINOR CHANGES. THE CHANGES
52                                      ENABLE THE PROGRAM TO RUN WITH A 30K MEMORY SYSTEM. THE PROGRAM
53                                      ALSO DEFAULTS TO RUNNING WITH 'FIS'' OPTIONS.
54                                      THIS IS A TEST OF ALL OPERATIONS AND INSTRUCTIONS THAT CAUSE
55                                      TRAPS, ODDITIES OF REGISTER 6, INTERRUPTS, THE RESET
56                                      AND WAIT INSTRUCTIONS.
57
58                              2.      REQUIREMENTS
59
60                              2.1     EQUIPMENT
61
62                                      LSI-11 STANDARD COMPUTER WITH AN SLU UNIT
63                                      AND 4K OF MEMORY
64
65                              2.2     STORAGE
66
67                                      2.2.1 PROGRAM STORAGE - THE ROUTINE USES 4K MEMORY
68
69                              3.      LOADING PROCEDURE
70
71                              3.1     METHOD
72
73                                      PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.
```

```
                                4.      STARTING PROCEDURE

                                        THE PROGRAM STARTS AT 200.  IF THIS PROGRAM RUNS UNDER APT
                                        NO CHANGE IS NECESSARY.  IF THIS PROGRAM RUNS ALONE THE
                                        OPERATOR HAS THE FOLLOWING OPTIONS BY SETTING
                                        THE SOFTWARE SWITCH REGISTER (LOCATION 422)

                                        BIT 6=1 (100 OCTAL) INHIBIT EIS/FIS OPTION TESTS.

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

                                        BIT 4=1 (20 OCTAL) WILL NOT ALLOW OPCODES 75400-76777 TO DO
                                                RESERVED INSTRUCTIONS TRAPS IN THE LAST TEST OF
                                                THIS DIAGNOSTIC.

                                        BIT 3=1 (10 OCTAL) WILL NOT ALLOW OPCODES 170000-177777 TO DO
                                                RESERVED INSTRUCTIONS TRAPS IN THE LAST TEST OF
                                                THIS DIAGNOSTIC.

                                        BIT 2=1 (4 OCTAL) WILL NOT ALLOW OPCODES 76030-76057 (DIS RESERVED OPCODE SPACE)
                                                NOR EIS OPCODES TO DO RESERVED INSTRUCTION TRAPS IN THE LAST
                                                TEST OF THIS DIAGNOSTIC

                                        THE PROGRAM STARTS AT 200.
                                        IF IT IS DESIRED TO RESET THE PASS COUNT BACK TO ZERO
                                        START AT LOCATION 210.

                                4.3     PROGRAM AND/OR OPERATOR ACTION

                                        LOAD PROGRAM INTO MEMORY. (BOTTOM 4K)
                                        SET THE DESIRED SWITCH REGISTER BITS,IF ANY.
                                        SET 'LTC'' SWITCH TO THE ''OFF'' POSITION.
                                        LOAD ADDRESS.
                                        START.
                                        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 CONTAIN A HALT (000000) (THIS LOCATION IS ALSO THE STATUS WORD FOR THAT VECTOR ENTRANCE. BUT THIS WILL HAVE NO EFFECT ON IT.

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

5.3 PROGRAM AND/OR OPERATOR ACTION

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

```
                        6.      ERRORS

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

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

                                EX:     CODE

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

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

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


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

```
                        7.      RESTRICTIONS

                        7.1     STARTING RESTRICTION

                                'LTC'' SWITCH MUST BE 'OFF''.

                        7.2     OPERATIONAL RESTRICTION

                                'LTC'' SWITCH MUST BE 'OFF''.

                --      8.      MISCELLANEOUS
                                THERE IS A TEST THAT WILL CHECK THAT ODD ADDRESSING
                                WILL IGNORE BIT '0''

                        8.1     EXECUTION TIME

                                FOR ONE PASS APROXIMATELY 8 SECONDS;THEN IT TYPES
                                'END OF PASS'' APROXIMATELY EVERY 2 MINUTES.

                        9.      PROGRAM DESCRIPTION

                                THIS PROGRAM CHECKS THAT ON ALL TRAP OPERATIONS REGISTER
                                6 IS DECREMENTED THE CORRECT AMOUNT, THAT THE CORRECT
                                PC IS SAVED ON THE STACK  THAT THE OLD CONDITION CODES AND
                                PRIORITY ARE PLACED ON THE STACK AND THAT THE NEW STATUS AND
                                CONDITION CODES ARE CORRECT.  BOTH THE ''TRAP'' AND 'EMT''
                                TRAP INSTRUCTIONS ARE TESTED TO SEE THAT ALL COMBINATIONS WILL
                                TRAP.  CHECKED ALSO ARE THE RTT AND THE RTI INSTRUCTIONS AND THAT ALL
                                RESTRICTED INSTRUCTIONS WILL TRAP.  VERIFICATION OF THE 'BPT'' INSTRUCTION (00003
                                WHICH IS USED FOR SOFTWARE DEBUG ROUTINES: ODT,DDT, IS DONE.
                                ALSO, THE TRACE BIT IS CHECKED TO SEE IF IT CAUSES A TRAP.
                                SPECIAL CHECKS ARE MADE TO SEE IF BUS
                                ERROR TRAPS OCCUR ON NON-EXISTENT MEMORY.
```

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

000007                              PC=%7
000006                              SP=%6
000003                              TAB %3
000000                              R0 %0
000001                              LAST=%1
000002                              FIRST=%2
000000                              HLT=HALT
104400                              TRAP=104400
104000                              EMT-104000
000003                              TRT=3
000004                              ITRAP5=4
000004                              RTRAP5=4            ;RESERVED INST AND ILLEGAL ADDRESSES
000014                              RTRAP4=14           ;FOR TRACE TRAP
000030                              RTRAP3-30           ;FOR EMULATOR TRAP
000020                              RTRAP2-20           ;FOR IOT TRAP
000034                              RTRAP1=34           ;FOR TRAP INST
177564                              TTCSR=177564
177560                              TRCSR=177560
177564                              TPS=177564
177566                              TPB=177566
000240                              BELL-240
000240                              NOP=240
000007                              TRAPA=000007
000010                              RTRAP=10
004700                              ILLA=004700
000100                              ILLB=100
000404                              $TSTNM=$TESTN
000402                              $ERROR=$FATAL
                                    .ABS
                          .MCALL    .$APTHDR
                          .MCALL    .$APTBLS
                          .MCALL    .$ACT11
```

```
                        000400                  .-400
                                        .SBTTL  ACT11 HOOKS
                                        ;*******************************************************************************
                                        ;HOOKS REQUIRED BY ACT11
                        000400                  $SVPC=.                 ;SAVE PC
                        000046                  .=46
000046  013232                          $ENDAD                          ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                        000052                  .=52
000052  000000                          .WORD   0                       ;;2)SET LOC.52 TO ZERO
                        000400                  . $SVPC                 ;; RESTORE PC
                                        .SBTTL  APT MAILBOX-ETABLE
                                        ;*******************************************************************************
                                        .EVEN
000400                                  $MAIL:                          ;;APT MAILBOX
000400  000000                          $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
000402  000000                          $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
000404  000000                          $TESTN: .WORD   ATESTN          ;;TEST NUMBER
000406  000000                          $PASS:  .WORD   APASS           ;;PASS COUNT
000410  000000                          $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
000412  000000                          $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
000414  000000                          $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
000416  000000                          $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
000420                                  $ETABLE:                        ;;APT ENVIRONMENT TABLE
000420     000                          $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
000421     000                          $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
000422  000000                          $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
000424  000000                          $USWR:  .WORD   AUSWR           ;;USER SWITCHES
000426  000000                          $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
                                        ;*                              BITS 15-11=CPU TYPE
                                        ;*                                      11/04=01,11/05=02,11/20=03,11/40 04,11/45=05
                                        ;*                                      11/70=06,PDQ=07,Q-10
                                        ;*                              BIT 10=REAL TIME CLOCK
                                        ;*                              BIT  9=FLOATING POINT PROCESSOR
                                        ;*                              BIT  8=MEMORY MANAGEMENT
000430     000                          $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
000431     000                          $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
                                        ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
                                        ;*                                      900 NSEC CORE=001
                                        ;*                                      300 NSEC BIPOLAR=002
                                        ;*                                      500 NSEC MOS=003
000432  000000                          $MADR1: .WORD   AMADR1          ;;HIGH ADDRESS,BLK#1
                                        ;*                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABOVE
000434     000                          $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
000435     000                          $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
000436  000000                          $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
000440     000                          $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
000441     000                          $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
000442  000000                          $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
000444     000                          $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
000445     000                          $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
```

```
(1)  000446  000000                $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
(1)  000450                        $ETEND:
(1)                                .MEXIT
426                                .SBTTL  APT PARAMETER BLOCK
(1)
(2)                                ;*****************************************************************************
(1)                                ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
(2)                                ;*****************************************************************************
(1)          000450                        .$X=.   ;;SAVE CURRENT LOCATION
(1)          000024                        .-24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
(1)  000024  000200                        200     ;;FOR APT START UP
(1)          000044                        . 44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
(1)  000044  000450                        $APTHDR ;;POINT TO APT HEADER BLOCK
(1)          000450                        .=.$X   ;;RESET LOCATION COUNTER
(2)                                ;*****************************************************************************
(1)                                ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
(1)                                ;INTERFACE SPEC.
(1)
(1)  000450                        $APTHD:
(1)  000450  000000                $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
(1)  000452  000400                $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
(1)  000454  000011                $TSTM:  .WORD   11      ;;RUN TIM OF LONGEST TEST
(1)  000456  000011                $PASTM: .WORD   11      ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
(1)  000460  000000                $UNITM: .WORD   0       ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
(1)  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  013302  177314      START:  MOV     #PWRDWN,24      ;SET UP THE POWER DOWN VECTOR
000510  012767  000340  177310              MOV     #340,26         ;SET UP POWER DOWN PRIORITY
000516  105767  177676                      TSTB    $ENV            ;ARE WE UNDER APT?
000522  001023                              BNE     BEGIN           ;YES
000524  005067  177671                      CLR     $ENVM
000530  005067  177672                      CLR     $CPUOP
000534  132767  000040  177660              BITB    #40,$SWREG      ;DO WE PRINT END OF PASS
000542  001403                              BEQ     1$              ;YES
000544  152767  000040  177647              BISB    #40,$ENVM

000552  016700  177644              1$:     MOV     $SWREG,R0       ;GET CONTENT OF $SWREG
000556  032700  000100                      BIT     #100,R0         ;TEST IF INHIBIT EIS/FIS SW SET
000562  001403                              BEQ     BEGIN           ;BR IF YES
000564  052767  000300  177634              BIS     #300,$CPUOP     ;NO SET UP LOCATION #CPUOP

000572  012737  177777  013262  BEGIN:  MOV     #-1,@#PASSPT
000600  012702  000400          RESTRT: MOV     #$MSGTY,%2
000604  005067  177570                  CLR     $MSGTY
000610  005067  177570                  CLR     $TSTNM
000614  005067  177562                  CLR     $ERROR
000620  000167  000026                  JMP     TST1
000624  000000                  K1:     0
000626  000000                  K2:     0
000630  000000                  K3:     0
000632  000000                  K4:     0
000634  000000                  K5:     0
000636  000000                  K6:     0
000640  052525                  K7:     052525
000642  052400                  K10:    052400
000644  000000                  K11:    0
000646  000000                  K12:    0
000650  000000                  HERE:   0
```

```
                                ;**********************************************************************
                                ;TEST 1 TEST AUTO INCREMENT AND DECREMENT OF R6 FOR WORD AND BYTES
                                ;**********************************************************************
000652  005237  000404          TST1:   INC     @#$TESTN        ;UPDATE TEST NUMBER
000656  022737  000001  000404          CMP     #1,@#$TESTN     ;SEQUENCE ERROR?
000664  001124                        BNE     TST2-12 ;BR TO ERROR HALT ON SEQ ERROR
000666  005006                R6TST:  CLR     %6
000670  112667  177754                MOVB    (6)+,HERE       ;SIX SHOULD INCREMENT BY TWO
000674  020627  000002                CMP     %6,#2
000700  001405                        BEQ     1$
000702  012737  000001  000402        MOV     #1,@#$FATAL     ;MOVE TO MAILBOX #  *******  1  *******
000710  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000712  000000                        HALT                    ;R6 DID NOT AUTO INCREMENT BY TWO
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 764

000714  012706  001000          1$:     MOV     #1000,%6
000720  114667  177724                MOVB    -(6),HERE       ;SHOULD DECREMENT BY TWO
000724  020627  000776                CMP     %6,#776
000730  001405                        BEQ     2$
000732  012737  000002  000402        MOV     #2,@#$FATAL     ;MOVE TO MAILBOX #  *******  2  *******
000740  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000742  000000                        HALT                    ;R6 DID NOT AUTO DECREMENT BY 2
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 750

000744  005006                2$:     CLR     %6
000746  112626                        MOVB    (6)+,(6)+       ;DOUBLES AUTO INCREMENT OF R6
000750  020627  000004                CMP     %6,#4
000754  001405                        BEQ     3$
000756  012737  000003  000402        MOV     #3,@#$FATAL     ;MOVE TO MAILBOX #  *******  3  *******
000764  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
000766  000000                        HALT                    ;WRONG AUTO INCREMENT OF R6
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 736

000770  005006                3$:     CLR     %6
000772  005004                        CLR     %4
000774  122624                        CMPB    (6)+,(4)+       ;TEST INCREMENT OF R6
000776  020627  000002                CMP     %6,#2
001002  001405                        BEQ     4$
001004  012737  000004  000402        MOV     #4,@#$FATAL     ;MOVE TO MAILBOX #  *******  4  *******
001012  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001014  000000                        HALT                    ;WRONG INCREMENT OF R6
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 723

001016  005006                4$:     CLR     %6
001020  005004                        CLR     %4
001022  122426                        CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
001024  020627  000002                CMP     %6,#2
001030  001405                        BEQ     5$
001032  012737  000005  000402        MOV     #5,@#$FATAL     ;MOVE TO MAILBOX #  *******  5  *******
```

```
   (2)  001040  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  001042  000000                        HALT                    ;WRONG INCREMENT OF R6
   (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                ; AND REPLACE NEXT INST W/ 710
   498
   499  001044  005006                  5$:   CLR     %6
   500  001046  005004                        CLR     %4
   501  001050  122624                        CMPB    (6)+,(4)+       ;TEST INCREMENT OF R4
   502  001052  020427  000001                CMP     %4,#1
   503  001056  001405                        BEQ     6$
   (3)  001060  012737  000006  000402        MOV     #6,@#$FATAL     ;MOVE TO MAILBOX #  *******  6  *******
   (2)  001066  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  001070  000000                        HALT                    ;WRONG INCREMENT OF R4
   (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                ; AND REPLACE NEXT INST W/ 675
   504
   505  001072  005006                  6$:   CLR     %6
   506  001074  005004                        CLR     %4
   507  001076  122426                        CMPB    (4)+,(6)+       ;TEST INCREMENT OF R4
   508  001100  020427  000001                CMP     %4,#1
   509  001104  001405                        BEQ     7$
   (3)  001106  012737  000007  000402        MOV     #7,@#$FATAL     ;MOVE TO MAILBOX #  *******  7  *******
   (2)  001114  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  001116  000000                        HALT                    ;WRONG INCREMENT OF R4
   (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                ; AND REPLACE NEXT INST W/ 662
   510
   511  001120  012706  001000          7$:   MOV     #1000,%6
   512  001124  124667  177520                CMPB    -(6),HERE       ;TEST DECREMENT OF R6
   513  001130  022706  000776                CMP     #776,%6
   514  001134  001405                        BEQ     TST2
   (4)  001136  012737  000010  000402        MOV     #10,@#$FATAL    ;MOVE TO MAILBOX #  *******  10  *******
   (3)  001144  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (3)  001146  000000                        HALT                    ;WRONG DECREMENT OF R6,OR WRONG $TESTN
   (5)                                                                ; TO SCOPE REPLACE HALT W/ 240
   (5)                                                                ; AND REPLACE NEXT INST W/ 646
```

```
 516
 517                                    ;********************************************************************************
 (2)                                    ;TEST 2 TEST TRANSFER OF BYTE USING R6
 (3)                                    ;********************************************************************************
 (2) 001150 005237 000404         TST2: INC     @#$TESTN          ;UPDATE TEST NUMBER
 (2) 001154 022737 000002 000404        CMP     #2,@#$TESTN       ;SEQUENCE ERROR?
 (2) 001162 001137                      BNE     TST3-12 ;BR TO ERROR HALT ON SEQ ERROR
 518 001164 012767 123456 177442        MOV     #123456,K5
 519 001172 012767 050505 177424        MOV     #050505,K1
 520 001200 012705 000624               MOV     #K1,%5            ;%5-(050505)K1
 521 001204 012706 000634               MOV     #K5,%6            ;%6-(123456)K5
 522 001210 112625                      MOVB    (6)+,(5)+         ;LOW .BYTE OF R6 TO R5
 523 001212 022767 050456 177404        CMP     #050456,K1
 524 001220 001405                      BEQ     1$
 (3) 001222 012737 000011 000402        MOV     #11,@#$FATAL      ;MOVE TO MAILBOX #  *******  11  *******
 (2) 001230 005212                      INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (2) 001232 000000                      HALT                      ;FALSE TRANSFER OF .BYTE
 (4)                                                              ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                              ; AND REPLACE NEXT INST W/ 753
 525
 526 001234 012767 123456 177372  1$:   MOV     #123456,K5
 527 001242 012767 050505 17735.        MOV     #050505,K1
 528 001250 012705 000624               MOV     #K1,%5            ;%5(050505)K1
 529 001254 012706 000636               MOV     #K6,%6            ;%6(123456)K5
 530 001260 114625                      MOVB    -(6),(5)+         ;LOW .BYTE OF R6 TO R5 (DECREMENT)
 531 001262 026727 177336 050456        CMP     K1,#050456
 532 001270 001405                      BEQ     2$
 (3) 001272 012737 000012 000402        MOV     #12,@#$FATAL      ;MOVE TO MAILBOX #  *******  12  *******
 (2) 001300 005212                      INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (2) 001302 000000                      HALT                      ;FALSE R6 .BYTE TRANSFER
 (4)                                                              ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                              ; AND REPLACE NEXT INST W/ 727
 533
 534 001304 012767 123456 177312  2$:   MOV     #123456,K1
 535 001312 012767 050505 177314        MOV     #050505,K5
 536 001320 012705 000624               MOV     #K1,%5            ;(123456)
 537 001324 012706 000634               MOV     #K5,%6            ;(050505)
 538 001330 112526                      MOVB    (5)+,(6)+         ;LOW OF R5 TO LOW OF R6
 539 001332 022767 050456 177274        CMP     #050456,K5
 540 001340 001405                      BEQ     3$
 (3) 001342 012737 000013 000402        MOV     #13,@#$FATAL      ;MOVE TO MAILBOX #  *******  13  *******
 (2) 001350 005212                      INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (2) 001352 000000                      HALT                      ;FALSE R6 .BYTE TRANSFER
 (4)                                                              ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                              ; AND REPLACE NEXT INST W/ 703
 541
 542 001354 012767 123456 177242  3$:   MOV     #123456,K1
 543 001362 012767 050505 177244        MOV     #050505,K5
 544 001370 012705 000625               MOV     #K1+1,%5          ;123456
 545 001374 012706 000634               MOV     #K5,%6            ;050505
 546 001400 112526                      MOVB    (5)+,(6)+         ;HIGH OF R5 TO LOW OF R6
 547 001402 026727 177226 050647        CMP     K5,#050647
 548 001410 001405                      BEQ     4$
 (3) 001412 012737 000014 000402        MOV     #14,@#$FATAL      ;MOVE TO MAILBOX #  *******  14  *******
```

```
 (2)  001420  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (2)  001422  000000                          HALT                    ;FALSE R6 .BYTE TRANSFER
 (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                  ; AND REPLACE NEXT INST W/ 657
549
550  001424  012767  123456  177172  4$:     MOV     #123456,K1
551  001432  012767  050505  177174          MOV     #050505,K5
552  001440  012705  000625                  MOV     #K1+1,%5        ;R5-123456-ODD ADDRESS
553  001444  012706  000634                  MOV     #K5,%6          ;R6-050505--.EVEN ADDRESS
554  001450  112625                          MOVB    (6)+,(5)+       ;LOW OF R6 TO HIGH OF R5
555  001452  022767  042456  177144          CMP     #042456,K1
556  001460  001405                          BEQ     TST3
 (4)  001462  012737  000015  000402          MOV     #15,@#$FATAL    ;MOVE TO MAILBOX #  *******  15  *******
 (3)  001470  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (3)  001472  000000                          HALT                    ;FAILED LOW OF 6 TO HIGH OF 5,OR WRONG $TESTN
 (5)                                                                  ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                  ; AND REPLACE NEXT INST W/ 633
```

```
                                        ;****************************************************************************
                                        ;TEST 3 TEST BYTE OPERATION WITH SEQUENTIAL ODD; .EVEN ADDRESS
                                        ;****************************************************************************
001474  005237  000404                  TST3:   INC     @#$TESTN            ;UPDATE TEST NUMBER
001500  022737  000003  000404                  CMP     #3,@#$TESTN         ;SEQUENCE ERROR?
001506  001103                                  BNE     TST4-12 ;BR TO ERROR HALT ON SEQ ERROR
001510  126767  177124  177123                  CMPB    K7,K7+1             ;SAME .WORD LOW TO HIGH
001516  001405                                  BEQ     1$
001520  012737  000016  000402                  MOV     #16,@#$FATAL        ;MOVE TO MAILBOX #  *******  16  *******
001526  005212                                  INC     (R2)                ;SET MSGTYP TO FATAL ERROR
001530  000000                                  HALT                        ;SHOULD COMPARE LOW TO HIGH
                                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                                            ; AND REPLACE NEXT INST W/ 766

001532  126767  177103  177100          1$:     CMPB    K7+1,K7             ;COMPARE ODD TO .EVEN SAME .WORD
001540  001405                                  BEQ     2$
001542  012737  000017  000402                  MOV     #17,@#$FATAL        ;MOVE TO MAILBOX #  *******  17  *******
001550  005212                                  INC     (R2)                ;SET MSGTYP TO FATAL ERROR
001552  000000                                  HALT                        ;ODD TO .EVEN .BYTE FAILURE
                                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                                            ; AND REPLACE NEXT INST W/ 755

001554  126767  177063  177056          2$:     CMPB    K10+1,K7            ;SEQUENTIAL .BYTES
                                                                            ;DIFFERENT .WORDS
001562  001462                                  BEQ     TST4
001564  012737  000020  000402                  MOV     #20,@#$FATAL        ;MOVE TO MAILBOX #  *******  20  *******
001572  005212                                  INC     (R2)                ;SET MSGTYP TO FATAL ERROR
001574  000000                                  HALT                        ;ODD TO .EVEN FAILED
                                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                                            ; AND REPLACE NEXT INST W/ 744

001576  126767  177040  177032                  CMPB    K10,K6
001604  001405                                  BEQ     3$
001606  012737  000021  000402                  MOV     #21,@#$FATAL        ;MOVE TO MAILBOX #  *******  21  *******
001614  005212                                  INC     (R2)                ;SET MSGTYP TO FATAL ERROR
001616  000000                                  HALT                        ;.EVEN TO EVEN FAILED
                                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                                            ; AND REPLACE NEXT INST W/ 733
001620  126767  177015  177015          3$:     CMPB    K7+1,K10+1
001626  001405                                  BEQ     4$
001630  012737  000022  000402                  MOV     #22,@#$FATAL        ;MOVE TO MAILBOX #  *******  22  *******
001636  005212                                  INC     (F2)                ;SET MSGTYP TO FATAL ERROR
001640  000000                                  HALT                        ;ODD TO ODD FAILED
                                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                                            ; AND REPLACE NEXT INST W/ 722

001642  126767  176774  176773          4$:     CMPB    K10,K10+1
001650  001005                                  BNE     5$
001652  012737  000023  000402                  MOV     #23,@#$FATAL        ;MOVE TO MAILBOX #  *******  23  *******
001660  005212                                  INC     (R2)                ;SET MSGTYP TO FATAL ERROR
001662  000000                                  HALT                        ;LOW TO HIGH IN SAME .WORD FAILED
                                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                                            ; AND REPLACE NEXT INST W/ 711
```

```
   577
   578  001664  126767  176753  176751  5$:     CMPB    K10+1,K10+1
   579  001672  001405                          BEQ     6$
   (3)  001674  012737  000024  000402          MOV     #24,@#$FATAL    ;MOVE TO MAILBOX #  *******  24  *******
   (2)  001702  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  001704  000000                          HALT                    ;HIGH TO LOW IN SAME .WORD FAILED
   (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                  ; AND REPLACE NEXT INST W/ 700
   580
   581  001706  126767  176730  176725  6$:     CMPB    K10,K7+1
   582  001714  001005                          BNE     TST4
   (4)  001716  012737  000025  000402          MOV     #25,@#$FATAL    ;MOVE TO MAILBOX #  *******  25  *******
   (3)  001724  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (3)  001726  000000                          HALT                    ;.EVEN TO ODD FAILED,OR WRONG $TESTN,OR WRONG $TESTN
   (5)                                                                  ; TO SCOPE REPLACE HALT W/ 240
   (5)                                                                  ; AND REPLACE NEXT INST W/ 667
```

```
                                        ;********************************************************************************
                                        ;TEST 4 TEST THE CC BITS
                                        ;********************************************************************************
001730  005237  000404        TST4:   INC     @#$TESTN        ;UPDATE TEST NUMBER
001734  022737  000004 000404         CMP     #4,@#$TESTN     ;SEQUENCE ERROR?
001742  001070                        BNE     TST5-12 ;BR TO ERROR HALT ON SEQ ERROR
001744  000277                        SCC                     ;SET STATUS
001746  005067  011144                CLR     STATUS          ;CLEAR STATUS
001752  106437                        .WORD   106437
001754  013116                        .WORD   STATUS
001756  103005                        BCC     1$
001760  012737  000026 000402        MOV     #26,@#$FATAL    ;MOVE TO MAILBOX #  *******  26  *******
001766  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
001770  000000                        HALT                    ;C NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 764
001772                          1$:
001772  102005                        BVC     2$
001774  012737  000027 000402        MOV     #27,@#$FATAL    ;MOVE TO MAILBOX #  *******  27  *******
002002  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002004  000000                        HALT                    ;V NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 756
002006                          2$:
002006  001005                        BNE     3$
002010  012737  000030 000402        MOV     #30,@#$FATAL    ;MOVE TO MAILBOX #  *******  30  *******
002016  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002020  000000                        HALT                    ;Z NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 750
002022                          3$:
002022  100005                        BPL     4$
002024  012737  000031 000402        MOV     #31,@#$FATAL    ;MOVE TO MAILBOX #  *******  31  *******
002032  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002034  000000                        HALT                    ;N NOT CLEAR
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 742

002036  000257                4$:     CCC                     ;CLEAR CONDITION CODES
002040  106737                        .WORD   106737
002042  013116                        .WORD   STATUS
002044  052767  000017 011044        BIS     #17,STATUS      ;SET STATUS TO ONES
002052  106437                        .WORD   106437
002054  013116                        .WORD   STATUS

002056  103405                        BCS     5$
002060  012737  000032 000402        MOV     #32,@#$FATAL    ;MOVE TO MAILBOX #  *******  32  *******
002066  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002070  000000                        HALT                    ;C NOT SET
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 724
002072                          5$:
002072  102405                        BVS     6$
```

```
   (3)  002074  012737  000033  000402          MOV     #33,@#$FATAL    ;MOVE TO MAILBOX #  *******  33  *******
   (2)  002102  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  002104  000000                           HALT                    ;V NOT SET
   (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                   ; AND REPLACE NEXT INST W/ 716
   601  002106                           6$:
   (1)  002106  001405                           BEQ     7$
   (3)  002110  012737  000034  000402          MOV     #34,@#$FATAL    ;MOVE TO MAILBOX #  *******  34  *******
   (2)  002116  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  002120  000000                           HALT                    ;Z NOT SET
   (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                   ; AND REPLACE NEXT INST W/ 710
   602  002122                           7$:
   (2)  002122  100405                           BMI     TST5
   (4)  002124  012737  000035  000402          MOV     #35,@#$FATAL    ;MOVE TO MAILBOX #  *******  35  *******
   (3)  002132  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (3)  002134  000000                           HALT                    ;N NOT SET,OR WRONG $TESTN
   (5)                                                                   ; TO SCOPE REPLACE HALT W/ 240
   (5)                                                                   ; AND REPLACE NEXT INST W/ 702
```

```
604
605                                          ;*******************************************************************************
(2)                                          ;TEST 5 TEST THAT A TRAP OCCURES ON A RESERVED INSTRUCTION
(3)                                          ;*******************************************************************************
(2)  002136 005237 000404                    TST5:   INC     @#$TESTN        ;UPDATE TEST NUMBER
(2)  002142 022737 000005 000404                     CMP     #5,@#$TESTN     ;SEQUENCE ERROR?
(2)  002150 001006                                   BNE     TST6-12 ;BR TO ERROR HALT ON SEQ ERROR
606  002152 012706 000500                            MOV     #BUFF,SP        ;STACK POINTER SETUP
607  002156 012767 002200 175624                     MOV     #RETA,RTRAP     ;RETURN LOCATION
608  002164 000007                                   TRAPA                   ;RESERVED INSTRUCTION, SHOULD TRAP
609  002166 012737 000036 000402                     MOV     #36,@#$FATAL    ;MOVE TO MAILBOX #  *******  36  *******
(2)  002174 005212                                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  002176 000000                                   HALT                    ;DID NOT TRAP OR WRONG $TESTN
(4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                          ; AND REPLACE NEXT INST W/ 764
610  002200                                  RETA:
611                                          ;*******************************************************************************
(2)                                          ;TEST 6 TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
(3)                                          ;*******************************************************************************
(2)  002200 005237 000404                    TST6:   INC     @#$TESTN        ;UPDATE TEST NUMBER
(2)  002204 022737 000006 000404                     CMP     #6,@#$TESTN     ;SEQUENCE ERROR?
(2)  002212 001011                                   BNE     TST7-12 ;BR TO ERROR HALT ON SEQ ERROR
612  002214 012706 000500                            MOV     #BUFF,SP        ,STACK POINTER SETUP
613  002220 012767 002230 175562                     MOV     #RETB,RTRAP     ;RETURN POINTER
614  002226 000007                                   TRAPA                   ;RESERVED INSTRUCTION
615  002230 020627 000474                    RETB:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
616  002234 001405                                   BEQ     TST7
(4)  002236 012737 000037 000402                     MOV     #37,@#$FATAL    ;MOVE TO MAILBOX #  *******  37  *******
(3)  002244 005212                                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(3)  002246 000000                                   HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
(5)                                                                          ; TO SCOPE REPLACE HALT W/ 240
(5)                                                                          ; AND REPLACE NEXT INST W/ 761
```

```
 618
 619                                          ;********************* **************************************************
  (2)                                         ;TEST 7 TEST THAT PROPER P.C. IS SAVED
  (3)                                         ;**********************************************************************
  (2)  002250  005237  000404                 TST7:   INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2)  002254  022737  000007  000404                 CMP     #7,@#$TESTN     ;SEQUENCE ERROR?
  (2)  002262  001012                                 BNE     TST10-12        ;BR TO ERROR HALT ON SEQ ERROR
 620   002264  012706  000500                         MOV     #BUFF,SP        ;STACK POINTER SETUP
 621   002270  012767  002300  175512                 MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
 622   002276  000007                         INSTC:  TRAPA                   ;TRAP ON THIS INSTRUCTION
 623   002300  022767  002300  176166         RETC:   CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
 624   002306  001405                                 BEQ     TST10
  (4)  002310  012737  000040  000402                 MOV     #40,@#$FATAL    ;MOVE TO MAILBOX #  *******  40  *******
  (3)  002316  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (3)  002320  000000                                 HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
  (5)                                                                         ; TO SCOPE REPLACE HALT W/ 240
  (5)                                                                         ; AND REPLACE NEXT INST W/ 760
 625                                          ;**********************************************************************
  (2)                                         ;TEST 10        TEST  THAT ''OLD'' STATUS AND PRIORITY ARE PLACED ON STACK
  (3)                                         ;**********************************************************************
  (2)  002322  005237  000404                 TST10:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2)  002326  022737  000010  000404                 CMP     #10,@#$TESTN    ;SEQUENCE ERROR?
  (2)  002334  001044                                 BNE     TST11-12        ;BR TO ERROR HALT ON SEQ ERROR
 626   002336  012706  000500                         MOV     #BUFF,SP        ;SET UP
 627   002342  012767  002364  175440                 MOV     #RETD,RTRAP     ;SET UP
 628   002350  005067  010542                         CLR     STATUS          ;CLEAR STATUS AND PRIORITY
 629   002354  106437                                 .WORD   106437
  (1)  002356  013116                                 .WORD   STATUS
 630   002360  000257                                 CCC
 631   002362  000007                                 TRAPA                   ;TRAP
 632   002364  026727  176106  000000         RETD:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
 633   002372  001405                                 BEQ     1$
  (3)  002374  012737  000041  000402                 MOV     #41,@#$FATAL    ;MOVE TO MAILBOX #  *******  41  *******
  (2)  002402  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  002404  000000                                 HALT                    ;INCORRECT STATUS
  (4)                                                                         ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                         ; AND REPLACE NEXT INST W/ 753
 634   002406  012706  000500                 1$:     MOV     #BUFF,SP        ;SET UP
 635   002412  012767  002436  175370                 MOV     #RETE,RTRAP     ;SET UP
 636   002420  012767  000357  010470                 MOV     #357,STATUS     ;SET PRIORITY
 637   002426  106437                                 .WORD   106437
  (1)  002430  013116                                 .WORD   STATUS
 638   002432  000277                                 SCC                     ;SET STATUS
 639   002434  000007                                 TRAPA                   ;TRAP
 640   002436  026727  176034  000357         RETE:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
 641   002444  001405                                 BEQ     TST11
  (4)  002446  012737  000042  000402                 MOV     #42,@#$FATAL    ;MOVE TO MAILBOX #  *******  42  *******
  (3)  002454  005212                                 INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (3)  002456  000000                                 HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
  (5)                                                                         ; TO SCOPE REPLACE HALT W/ 240
  (5)                                                                         ; AND REPLACE NEXT INST W/ 726
```

```
643
644                                     ;*********************************************************************************
(2)                                     ;TEST 11        TEST  THAT 'NEW'' STATUS IS CORRECT
(3)                                     ;*********************************************************************************
(2)  002460  005237  000404             TST11:  INC     @#$TESTN         ;UPDATE TEST NUMBER
(2)  002464  022737  000011  000404             CMP     #11,@#$TESTN     ;SEQUENCE ERROR?
(2)  002472  001125                             BNE     RSTP1            ;BR TO ERROR HALT ON SEQ ERROR
645  002474  012706  000500                     MOV     #BUFF,SP
646  002500  012767  002514  175302             MOV     #RETF,RTRAP
647  002506  005067  175300                     CLR     RTRAP+2          ;CLEAR FUTURE PRIORITY AND CC
648  002512  000007                             TRAPA
649  002514                             RETF:
650  002514  100005                             BPL     1$
(3)  002516  012737  000043  000402             MOV     #43,@#$FATAL     ;MOVE TO MAILBOX #  *******  43  *******
(2)  002524  005212                             INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(2)  002526  000000                             HALT                     ;C NOT CLEARED
(4)                                                                      ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                      ; AND REPLACE NEXT INST W/ 761
651  002530                             1$:
(1)  002530  001005                             BNE     2$
(3)  002532  012737  000044  000402             MOV     #44,@#$FATAL     ;MOVE TO MAILBOX #  *******  44  *******
(2)  002540  005212                             INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(2)  002542  000000                             HALT                     ;Z NOT CLEARED
(4)                                                                      ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                      ; AND REPLACE NEXT INST W/ 753
652  002544                             2$:
(1)  002544  102005                             BVC     3$
(3)  002546  012737  000045  000402             MOV     #45,@#$FATAL     ;MOVE TO MAILBOX #  *******  45  *******
(2)  002554  005212                             INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(2)  002556  000000                             HALT                     ;V NOT CLEARED
(4)                                                                      ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                      ; AND REPLACE NEXT INST W/ 745
653  002560                             3$:
(1)  002560  103005                             BCC     4$
(3)  002562  012737  000046  000402             MOV     #46,@#$FATAL     ;MOVE TO MAILBOX #  *******  46  *******
(2)  002570  005212                             INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(2)  002572  000000                             HALT                     ;C NOT CLEARED
(4)                                                                      ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                      ; AND REPLACE NEXT INST W/ 737
654  002574                             4$:
(1)  002574  106737                             .WORD   106737
(1)  002576  013116                             .WORD   STATUS
655  002600  032767  000340  010310             BIT     #340,STATUS              ;TEST PRIORITY
656  002606  001405                             BEQ     5$
(3)  002610  012737  000047  000402             MOV     #47,@#$FATAL     ;MOVE TO MAILBOX #  *******  47  *******
(2)  002616  005212                             INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(2)  002620  000000                             HALT                     ;PRIORITY NOT ZERO
(4)                                                                      ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                      ; AND REPLACE NEXT INST W/ 724
657  002622  012706  000500             5$:     MOV     #BUFF,SP
658  002626  012767  002644  175154             MOV     #RETG,RTRAP
659  002634  012767  000357  175150             MOV     #357,RTRAP+2     ;SET NEW ''CC'' AND PRIORITY
660  002642  000007                             TRAPA                    ;TRAP HERE
661  002644                             RETG:
```

```
  662  002644  100405                          BMI     1$
  (3)  002646  012737  000050  000402          MOV     #50,@#$FATAL    ;MOVE TO MAILBOX #  *******  50  *******
  (2)  002654  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  002656  000000                          HALT                    ;N NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 705
  663  002660                          1$:
  (1)  002660  001405                          BEQ     2$
  (3)  002662  012737  000051  000402          MOV     #51,@#$FATAL    ;MOVE TO MAILBOX #  *******  51  *******
  (2)  002670  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  002672  000000                          HALT                    ;Z NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 677
  664  002674                          2$:
  (1)  002674  102405                          BVS     3$
  (3)  002676  012737  000052  000402          MOV     #52,@#$FATAL    ;MOVE TO MAILBOX #  *******  52  *******
  (2)  002704  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  002706  000000                          HALT                    ;V NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 671
  665  002710                          3$:
  (1)  002710  103405                          BCS     4$
  (3)  002712  012737  000053  000402          MOV     #53,@#$FATAL    ;MOVE TO MAILBOX #  *******  53  *******
  (2)  002720  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  002722  000000                          HALT                    ;C NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 663
  666  002724                          4$:
  (1)  002724  106737                          .WORD   106737
  (1)  002726  013116                          .WORD   STATUS
  667  002730  016700  010162                  MOV     STATUS,SP
  668  002734  042706  000017                  BIC     #17,SP
  669  002740  022706  000340                  CMP     #340,SP
  670  002744  001405                          BEQ     RST1
  (1)  002746                          RSTP1:
  (3)  002746  012737  000054  000402          MOV     #54,@#$FATAL    ;MOVE TO MAILBOX #  *******  54  *******
  (2)  002754  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  002756  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 645
  671  002760  012767  000012  175022  RST1:  MOV     #12,10
  672  002766  005067  175020                  CLR     12
```

```
674
675                                            ;*******************************************************************************
(2)                                            ;TEST 12        TEST  THAT A TRAP OCCURES FOR A ''TRAP' INSTRUCTION
(3)                                            ;*******************************************************************************
(2)   002772  005237  000404                   TST12:  INC     @#$TESTN         ;UPDATE TEST NUMBER
(2)   002776  022737  000012  000404                   CMP     #12,@#$TESTN     ;SEQUENCE ERROR?
(2)   003004  001006                                   BNE     TST13-12         ;BR TO ERROR HALT ON SEQ ERROR
676   003006  012706  000500                           MOV     #BUFF,SP         ;STACK POINTER SETUP
677   003012  012767  003034  175014                   MOV     #RETA1,RTRAP1    ;RETURN LOCATION
678   003020  104400                                   TRAP                     ;RESERVED INSTRUCTION, SHOULD TRAP
679   003022  012737  000055  000402                   MOV     #55,@#$FATAL     ;MOVE TO MAILBOX #  *******  55  *******
(2)   003030  005212                                   INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(2)   003032  000000                                   HALT                     ;DID NOT TRAP,OR WRONG $TESN
(4)                                                                             ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                             ; AND REPLACE NEXT INST W/ 764
680   003034                                   RETA1:
681                                            ;*******************************************************************************
(2)                                            ;TEST 13        TEST  DECREMENT OF STACK POINTER ON A TRAP OPERATION
(3)                                            ;*******************************************************************************
(2)   003034  005237  000404                   TST13:  INC     @#$TESTN         ;UPDATE TEST NUMBER
(2)   003040  022737  000013  000404                   CMP     #13,@#$TESTN     ;SEQUENCE ERROR?
(2)   003046  001011                                   BNE     TST14-12         ;BR TO ERROR HALT ON SEQ ERROR
682   003050  012706  000500                           MOV     #BUFF,SP         ;STACK POINTER SETUP
683   003054  012767  003064  174752                   MOV     #RETB1,RTRAP1    ;RETURN POINTER
684   003062  104400                                   TRAP                     ;RESERVED INSTRUCTION
685   003064  020627  000474                   RETB1:  CMP     SP,#BUFF-4       ;TEST DECREMENT OF SP
686   003070  001405                                   BEQ     TST14
(4)   003072  012737  000056  000402                   MOV     #56,@#$FATAL     ;MOVE TO MAILBOX #  *******  56  *******
(3)   003100  005212                                   INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(3)   003102  000000                                   HALT                     ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
(5)                                                                             ; TO SCOPE REPLACE HALT W/ 240
(5)                                                                             ; AND REPLACE NEXT INST W/ 761
687                                            ;*******************************************************************************
(2)                                            ;TEST 14        TEST  THAT PROPER P.C. IS SAVED
(3)                                            ;*******************************************************************************
(2)   003104  005237  000404                   TST14:  INC     @#$TESTN         ;UPDATE TEST NUMBER
(2)   003110  022737  000014  000404                   CMP     #14,@#$TESTN     ;SEQUENCE ERROR?
(2)   003116  001012                                   BNE     TST15-12         ;BR TO ERROR HALT ON SEQ ERROR
688   003120  012706  000500                           MOV     #BUFF,SP         ;STACK POINTER SETUP
689   003124  012767  003134  174702                   MOV     #RETC1,RTRAP1    ;RETURN FROM TRAP POINTER
690   003132  104400                                   TRAP                     ;TRAP ON THIS INSTRUCTION
691   003134  022767  003134  175332           RETC1:  CMP     #.,BUFF-4        ;CHECK INCREMENTED P.C.
692   003142  001405                                   BEQ     TST15
(4)   003144  012737  000057  000402                   MOV     #57,@#$FATAL     ;MOVE TO MAILBOX #  *******  57  *******
(3)   003152  005212                                   INC     (R2)             ;SET MSGTYP TO FATAL ERROR
(3)   003154  000000                                   HALT                     ;INCORRECT P.C.,OR WRONG $TESTN
(5)                                                                             ; TO SCOPE REPLACE HALT W/ 240
(5)                                                                             ; AND REPLACE NEXT INST W/ 760
```

```
694
695                                         ;*********************************************************************************
(2)                                         ;TEST 15        TEST  THAT "OLD" STATUS AND PRIORITY ARE PLACED ON STACK
(3)                                         ;*********************************************************************************
(2)   003156  005237  000404                TST15:  INC     @#$TESTN        ;UPDATE TEST NUMBER
(2)   003162  022737  000015  000404                CMP     #15,@#$TESTN    ;SEQUENCE ERROR?
(2)   003170  001043                                BNE     TST16-12        ;BR TO ERROR HALT ON SEQ ERROR
696   003172  012706  000500                        MOV     #BUFF,SP        ;SET UP
697   003176  012767  003220  174630                MOV     #RETD1,RTRAP1   ;SET UP
698   003204  005067  007706                        CLR     STATUS          ;CLEAR STATUS AND PRIORITY
699   003210  106437                                .WORD   106437
(1)   003212  013116                                .WORD   STATUS
700   003214  000257                                CCC
701   003216  104400                                TRAP                    ;TRAP
702   003220  026727  175252  000000        RETD1:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
703   003226  001405                                BEQ     1$
(3)   003230  012737  000060  000402                MOV     #60,@#$FATAL    ;MOVE TO MAILBOX #  *******  60  *******
(2)   003236  005212                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)   003240  000000                                HALT                    ;INCORRECT STATUS
(4)                                                                         ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                         ; AND REPLACE NEXT INST W/ 753
704   003242  012706  000500                1$:     MOV     #BUFF,SP        ;SET UP
705   003246  012767  003270  174560                MOV     #RETE1,RTRAP1   ;SET UP
706   003254  012767  000357  007634                MOV     #357,STATUS             ;SET PRIORITY
707   003262  106437                                .WORD   106437
(1)   003264  013116                                .WORD   STATUS
708   003266  104400                                TRAP                    ;SET CC
709   003270  026727  175202  000357        RETE1:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
710   003276  001405                                BEQ     TST16
(4)   003300  012737  000061  000402                MOV     #61,@#$FATAL    ;MOVE TO MAILBOX #  *******  61  *******
(3)   003306  005212                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(3)   003310  000000                                HALT                    ;INCORRECT STATUS ON STACK
(5)                                                                         ; TO SCOPE REPLACE HALT W/ 240
(5)                                                                         ; AND REPLACE NEXT INST W/ 727
```

```
                        ;********************************************************************************
                        ;TEST 16        TEST THAT 'NEW'' STATUS IS CORRECT
                        ;********************************************************************************
003312  005237  000404  TST16:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003316  022737  000016  000404   CMP     #16,@#$TESTN    ;SEQUENCE ERROR?
003324  001125           BNE     TST17-12        ;BR TO ERROR HALT ON SEQ ERROR
003326  012706  000500   MOV     #BUFF,SP
003332  012767  003346  174474   MOV     #RETF1,RTRAP1
003340  005067  174472           CLR     RTRAP1+2        ;CLEAR FUTURE PRIORITY AND CC
003344  104400           TRAP
003346                   RETF1:
003346  100005           BPL     1$
003350  012737  000062  000402   MOV     #62,@#$FATAL    ;MOVE TO MAILBOX #  *******  62  *******
003356  005212           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003360  000000           HALT                    ;C NOT CLEARED
                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                 ; AND REPLACE NEXT INST W/ 761
003362                   1$:
003362  001005           BNE     2$
003364  012737  000063  000402   MOV     #63,@#$FATAL    ;MOVE TO MAILBOX #  *******  63  *******
003372  005212           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003374  000000           HALT                    ;Z NOT CLEARED
                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                 ; AND REPLACE NEXT INST W/ 753
003376                   2$:
003376  102005           BVC     3$
003400  012737  000064  000402   MOV     #64,@#$FATAL    ;MOVE TO MAILBOX #  *******  64  *******
003406  005212           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003410  000000           HALT                    ;V NOT CLEARED
                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                 ; AND REPLACE NEXT INST W/ 745
003412                   3$:
003412  103005           BCC     4$
003414  012737  000065  000402   MOV     #65,@#$FATAL    ;MOVE TO MAILBOX #  *******  65  *******
003422  005212           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003424  000000           HALT                    ;C NOT CLEARED
                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                 ; AND REPLACE NEXT INST W/ 737
003426                   4$:
003426  106737           .WORD   106737
003430  013116           .WORD   STATUS
003432  032767  000340  007456   BIT     #340,STATUS             ;TEST PRIORITY
003440  001405           BEQ     5$
003442  012737  000066  000402   MOV     #66,@#$FATAL    ;MOVE TO MAILBOX #  *******  66  *******
003450  005212           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003452  000000           HALT                    ;PRIORITY NOT ZERO
                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                 ; AND REPLACE NEXT INST W/ 724
003454  012706  000500   5$:     MOV     #BUFF,SP
003460  012767  003476  174346   MOV     #RETG1,RTRAP1
003466  012767  000357  174342   MOV     #357,RTRAP1+2   ;SET NEW ''CC'' AND PRIORITY
003474  104400           TRAP                    ;TRAP HERE
003476                   RETG1:
```

```
 731  003476  100405                           BMI     1$
 (3)  003500  012737  000067  000402           MOV     #67,@#$FATAL     ;MOVE TO MAILBOX #  *******  67  *******
 (2)  003506  005212                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (2)  003510  000000                           HALT                     ;N NOT SET
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 705
 732  003512                          1$:
 (1)  003512  001405                           BEQ     2$
 (3)  003514  012737  000070  000402           MOV     #70,@#$FATAL     ;MOVE TO MAILBOX #  *******  70  *******
 (2)  003522  005212                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (2)  003524  000000                           HALT                     ;Z NOT SET
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 677
 733  003526                          2$:
 (1)  003526  102405                           BVS     3$
 (3)  003530  012737  000071  000402           MOV     #71,@#$FATAL     ;MOVE TO MAILBOX #  *******  71  *******
 (2)  003536  005212                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (2)  003540  000000                           HALT                     ;V NOT SET
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 671
 734  003542                          3$:
 (1)  003542  103405                           BCS     4$
 (3)  003544  012737  000072  000402           MOV     #72,@#$FATAL     ;MOVE TO MAILBOX #  *******  72  *******
 (2)  003552  005212                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (2)  003554  000000                           HALT                     ;C NOT SET
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 663
 735  003556                          4$:
 (1)  003556  106737                           .WORD   106737
 (1)  003560  013116                           .WORD   STATUS
 736  003562  016706  007330                   MOV     STATUS,SP
 737  003566  042706  000017                   BIC     #17,SP
 738  003572  022706  000340                   CMP     #340,SP
 739  003576  001405                           BEQ     TST17
 (4)  003600  012737  000073  000402           MOV     #73,@#$FATAL     ;MOVE TO MAILBOX #  *******  73  *******
 (3)  003606  005212                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (3)  003610  000000                           HALT                     ;PRIORITY WAS CHANGED,OR WRONG $TESTN
 (5)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                    ; AND REPLACE NEXT INST W/ 645
```

```
                                   ;*********************************************************************
                                   ;TEST 17          TEST  THAT ALL COMBINATION OF ''TRAP'' WILL CAUSE A TRAP
                                   ;*********************************************************************
003612  005237  000404            TST17:  INC     @#$TESTN          ;UPDATE TEST NUMBER
003616  022737  000017  000404            CMP     #17,@#$TESTN      ;SEQUENCE ERROR?
003624  001011                            BNE     RB1AA             ;BR TO ERROR HALT ON SEQ ERROR
003626  012767  104400  000012            MOV     #TRAP,RB1         ;INITIALIZE BASE TRAP INSTRUCTION
003634  012767  003662  174172            MOV     #RA1,34           ;RETURN FROM TRAP TO RA1
003642  012706  000500            RC1:    MOV     #BUFF,SP          ;SET UP STACK POINTER
003646  104400                    RB1:    TRAP                      ;TRAP INST WILL BE MODIFIED TO TRAP+377
003650                            RB1AA:
003650  012737  000074  000402            MOV     #74,@#$FATAL      ;MOVE TO MAILBOX #  *******  74  *******
003656  005212                            INC     (R2)              ;SET MSGTYP TO FATAL ERROR
003660  000000                            HALT                      ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TESTN
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 761
003662  005267  177760            RA1:    INC     RB1
003666  022767  104777  177752            CMP     #104777,RB1       ;TRAP+377 TO UPPER LIMIT
003674  103362                            BHIS    RC1               ;HAVE WE TESTED ALL
003676  012767  000036  174130            MOV     #36,34
003704  005067  174126                    CLR     36
                                   ;*********************************************************************
                                   ;TEST 20          TEST  THAT A TRAP OCCURES ON AN ''IOT'' INSTRUCTION
                                   ;*********************************************************************
003710  005237  000404            TST20:  INC     @#$TESTN          ;UPDATE TEST NUMBER
003714  022737  000020  000404            CMP     #20,@#$TESTN      ;SEQUENCE ERROR?
003722  001006                            BNE     TST21-12          ;BR TO ERROR HALT ON SEQ ERROR
003724  012706  000500                    MOV     #BUFF,SP          ;STACK POINTER SETUP
003730  012767  003752  174062            MOV     #RETA2,RTRAP2     ;RETURN LOCATION
003736  000004                            IOT                       ;RESERVE INSTRUCTION, SHOULD TRAP
003740  012737  000075  000402            MOV     #75,@#$FATAL      ;MOVE TO MAILBOX #  *******  75  *******
003746  005212                            INC     (R2)              ;SET MSGTYP TO FATAL ERROR
003750  000000                            HALT                      ;IOT DID NOT TRAP,OR WRONG $TESTN
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 764
003752                            RETA2:
                                   ;*********************************************************************
                                   ;TEST 21          TEST  DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                   ;*********************************************************************
003752  005237  000404            TST21:  INC     @#$TESTN          ;UPDATE TEST NUMBER
003756  022737  000021  000404            CMP     #21,@#$TESTN      ;SEQUENCE ERROR?
003764  001011                            BNE     TST22-12          ;BR TO ERROR HALT ON SEQ ERROR
003766  012706  000500                    MOV     #BUFF,SP          ;STACK POINTER SETUP
003772  012767  004002  174020            MOV     #RETB2,RTRAP2     ;RETURN POINTER
004000  000004                            IOT                       ;RESERVED INSTRUCTION
004002  020627  000474            RETB2:  CMP     SP,#BUFF-4        ;TEST DECREMENT OF SP
004006  001405                            BEQ     TST22
004010  012737  000076  000402            MOV     #76,@#$FATAL      ;MOVE TO MAILBOX #  *******  76  *******
004016  005212                            INC     (R2)              ;SET MSGTYP TO FATAL ERROR
004020  000000                            HALT                      ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 761
```

```
 766
 767                                          ;*********************** *******************************************************
 (2)                                          ;TEST 22        TEST  THAT PROPER P.C. IS SAVED
 (3)                                          ;*******************************************************************************
 (2)  004022  005237  000404          TST22:  INC     @#$TESTN          ;UPDATE TEST NUMBER
 (2)  004026  022737  000022  000404          CMP     #22,@#$TESTN      ;SEQUENCE ERROR?
 (2)  004034  001012                          BNE     TST23-12          ;BR TO ERROR HALT ON SEQ ERROR
 768  004036  012706  000500                  MOV     #BUFF,SP          ;STACK POINTER SETUP
 769  004042  012767  004052  173750          MOV     #RETC2,RTRAP2     ;RETURN FROM TRAP POINTER
 770  004050  000004                          IOT                       ;TRAP ON THIS INSTRUCTION
 771  004052  022767  004052  174414  RETC2:  CMP     #.,BUFF-4         ;CHECK FOR INCREMENTED P.C.
 772  004060  001405                          BEQ     TST23
 (4)  004062  012737  000077  000402          MOV     #77,@#$FATAL      ;MOVE TO MAILBOX #  *******  77  *******
 (3)  004070  005212                          INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (3)  004072  000000                          HALT                      ;INCORRECT P.C.,OR WRONG $TESTN
 (5)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                    ; AND REPLACE NEXT INST W/ 760
 773                                          ;*******************************************************************************
 (2)                                          ;TEST 23        TEST  THAT "OLD" STATUS AND PRIORITY ARE PLACED ON STACK
 (3)                                          ;*******************************************************************************
 (2)  004074  005237  000404          TST23:  INC     @#$TESTN          ;UPDATE TEST NUMBER
 (2)  004100  022737  000023  000404          CMP     #23,@#$TESTN      ;SEQUENCE ERROR?
 (2)  004106  001044                          BNE     TST24-12          ;BR TO ERROR HALT ON SEQ ERROR
 774  004110  012706  000500                  MOV     #BUFF,SP          ;SET UP
 775  004114  012767  004136  173676          MOV     #RETD2,RTRAP2     ;SET UP
 776  004122  005067  006770                  CLR     STATUS            ;CLEAR STATUS AND PRIORITY
 777  004126  106437                          .WORD   106437
 (1)  004130  013116                          .WORD   STATUS
 778  004132  000257                          CCC
 779  004134  000004                          IOT                       ;TRAP
 780  004136  026727  174334  000000  RETD2:  CMP     BUFF-2,#0         ;TEST THAT OLD STATUS WENT TO STACK
 781  004144  001405                          BEQ     1$
 (3)  004146  012737  000100  000402          MOV     #100,@#$FATAL     ;MOVE TO MAILBOX #  *******  100  *******
 (2)  004154  005212                          INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (2)  004156  000000                          HALT                      ;INCORRECT STATUS
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 753
 782  004160  012706  000500          1$:     MOV     #BUFF,SP          ;SET UP
 783  004164  012767  004210  173626          MOV     #RETE2,RTRAP2     ;SET UP
 784  004172  012767  000357  006716          MOV     #357,STATUS               ;SET PRIORITY
 785  004200  106437                          .WORD   106437
 (1)  004202  013116                          .WORD   STATUS
 786  004204  000277                          SCC                       ;SET CC
 787  004206  000004                          IOT                       ;TRAP
 788  004210  026727  174262  000357  RETE2:  CMP     BUFF-2,#357       ;COMPARES STATUS ON STACK
 789  004216  001405                          BEQ     TST24
 (4)  004220  012737  000101  000402          MOV     #101,@#$FATAL     ;MOVE TO MAILBOX #  *******  101  *******
 (3)  004226  005212                          INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (3)  004230  000000                          HALT                      ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
 (5)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                    ; AND REPLACE NEXT INST W/ 726
```

```
                                  ;******************** *****************************************************
                                  ;TEST 24          TEST  THAT "NEW" STATUS IS CORRECT
                                  ;***********************************************************************
004232 005237 000404              TST24:  INC    @#$TESTN          ;UPDATE TEST NUMBER
004236 022737 000024 000404               CMP    #24,@#$TESTN      ;SEQUENCE ERROR?
004244 001125                             BNE    STP               ;BR TO ERROR HALT ON SEQ ERROR
004246 012706 000500                      MOV    #BUFF,SP
004252 012767 004266 173540               MOV    #RETF2,RTRAP2
004260 005067 173536                      CLR    RTRAP2+2          ;CLEAR FUTURE PRIORITY AND CC
004264 000004                             IOT
004266                            RETF2:
004266 100005                             BPL    1$
004270 012737 000102 000402               MOV    #102,@#$FATAL     ;MOVE TO MAILBOX #  *******  102  *******
004276 005212                             INC    (R2)              ;SET MSGTYP TO FATAL ERROR
004300 000000                             HALT                     ;C NOT CLEARED
                                                                   ; TO SCOPE REPLACE HALT W/ 240
                                                                   ; AND REPLACE NEXT INST W/ 761
004302                            1$:
004302 001005                             BNE    2$
004304 012737 000103 000402               MOV    #103,@#$FATAL     ;MOVE TO MAILBOX #  *******  103  *******
004312 005212                             INC    (R2)              ;SET MSGTYP TO FATAL ERROR
004314 000000                             HALT                     ;Z NOT CLEARED
                                                                   ; TO SCOPE REPLACE HALT W/ 240
                                                                   ; AND REPLACE NEXT INST W/ 753
004316                            2$:
004316 102005                             BVC    3$
004320 012737 000104 000402               MOV    #104,@#$FATAL     ;MOVE TO MAILBOX #  *******  104  *******
004326 005212                             INC    (R2)              ;SET MSGTYP TO FATAL ERROR
004330 000000                             HALT                     ;V NOT CLEARED
                                                                   ; TO SCOPE REPLACE HALT W/ 240
                                                                   ; AND REPLACE NEXT INST W/ 745
004332                            3$:
004332 103005                             BCC    4$
004334 012737 000105 000402               MOV    #105,@#$FATAL     ;MOVE TO MAILBOX #  *******  105  *******
004342 005212                             INC    (R2)              ;SET MSGTYP TO FATAL ERROR
004344 000000                             HALT                     ;C NOT CLEARED
                                                                   ; TO SCOPE REPLACE HALT W/ 240
                                                                   ; AND REPLACE NEXT INST W/ 737
004346                            4$:
004346 106737                             .WORD  106737
004350 013116                             .WORD  STATUS
004352 032767 000340 006536               BIT    #340,STATUS                 ;TEST PRIORITY
004360 001405                             BEQ    5$
004362 012737 000106 000402               MOV    #106,@#$FATAL     ;MOVE TO MAILBOX #  *******  106  *******
004370 005212                             INC    (R2)              ;SET MSGTYP TO FATAL ERROR
004372 000000                             HALT                     ;PRIORITY NOT ZERO
                                                                   ; TO SCOPE REPLACE HALT W/ 240
                                                                   ; AND REPLACE NEXT INST W/ 724
004374 012706 000500              5$:     MOV    #BUFF,SP
004400 012767 004416 173412               MOV    #RETG2,RTRAP2
004406 012767 000357 173406               MOV    #357,RTRAP2+2     ;SET NEW "CC" AND PRIORITY
004414 000004                             IOT                      ;TRAP HERE
004416                            RETG2:
```

```
  810  004416  100405                        BMI     1$
  (3)  004420  012737  000107  000402        MOV     #107,@#$FATAL   ;MOVE TO MAILBOX #  *******  107  *******
  (2)  004426  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  004430  000000                        HALT                    ;N NOT SET
  (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                ; AND REPLACE NEXT INST W/ 705
  811  004432                        1$:
  (1)  004432  001405                        BEQ     2$
  (3)  004434  012737  000110  000402        MOV     #110,@#$FATAL   ;MOVE TO MAILBOX #  *******  110  *******
  (2)  004442  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  004444  000000                        HALT                    ;Z NOT SET
  (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                ; AND REPLACE NEXT INST W/ 677
  812  004446                        2$:
  (1)  004446  102405                        BVS     3$
  (3)  004450  012737  000111  000402        MOV     #111,@#$FATAL   ;MOVE TO MAILBOX #  *******  111  *******
  (2)  004456  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  004460  000000                        HALT                    ;V NOT SET
  (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                ; AND REPLACE NEXT INST W/ 671
  813  004462                        3$:
  (1)  004462  103405                        BCS     4$
  (3)  004464  012737  000112  000402        MOV     #112,@#$FATAL   ;MOVE TO MAILBOX #  *******  112  *******
  (2)  004472  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  004474  000000                        HALT                    ;C NOT SET
  (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                ; AND REPLACE NEXT INST W/ 663
  814  004476                        4$:
  (1)  004476  106737                        .WORD   106737
  (1)  004500  013116                        .WORD   STATUS
  815  004502  016706  006410                MOV     STATUS,SP
  816  004506  042706  000017                BIC     #17,SP
  817  004512  022706  000340                CMP     #340,SP
  818  004516  001405                        BEQ     STPA
  (1)  004520                        STP:
  (3)  004520  012737  000113  000402        MOV     #113,@#$FATAL   ;MOVE TO MAILBOX #  *******  113  *******
  (2)  004526  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  004530  000000                        HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
  (4)                                                                ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                ; AND REPLACE NEXT INST W/ 645
  819  004532  012767  000022  173260  STPA: MOV     #22,20
  820  004540  005067  173256                CLR     22
```

```
                                        ;************************************************************************
                                        ;TEST 25        TEST  THAT A TRAP OCCURS ON AN EMT RESTRICTED INSTRUCTION
                                        ;************************************************************************
 004544  005237  000404          TST25:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 004550  022737  000025  000404          CMP     #25,@#$TESTN    ;SEQUENCE ERROR?
 004556  001006                          BNE     TST26-12        ;BR TO ERROR HALT ON SEQ ERROR
 004560  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
 004564  012767  004606  173236          MOV     #RETA3,RTRAP3   ;RETURN LOCATION
 004572  104000                          EMT                     ;RESERVE INSTRUCTIOM, SHOULD TRAP
 004574  012737  000114  000402          MOV     #114,@#$FATAL   ;MOVE TO MAILBOX #  *******  114  *******
 004602  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 004604  000000                          HALT                    ;EMT DID NOT TRAP,OR WRONG $TESTN
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 764
 004606                          RETA3:
                                        ;************************************************************************
                                        ;TEST 26        TEST  DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                        ;************************************************************************
 004606  005237  000404          TST26:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 004612  022737  000026  000404          CMP     #26,@#$TESTN    ;SEQUENCE ERROR?
 004620  001011                          BNE     TST27-12        ;BR TO ERROR HALT ON SEQ ERROR
 004622  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
 004626  012767  004636  173174          MOV     #RETB3,RTRAP3   ;RETURN POINTER
 004634  104000                          EMT                     ;RESERVED INSTRUCTION
 004636  020627  000474          RETB3:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
 004642  001405                          BEQ     TST27
 004644  012737  000115  000402          MOV     #115,@#$FATAL   ;MOVE TO MAILBOX #  *******  115  *******
 004652  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 004654  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 761
                                        ;************************************************************************
                                        ;TEST 27        TEST  THAT PROPER P.C. IS SAVED
                                        ;************************************************************************
 004656  005237  000404          TST27:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 004662  022737  000027  000404          CMP     #27,@#$TESTN    ;SEQUENCE ERROR?
 004670  001012                          BNE     TST30-12        ;BR TO ERROR HALT ON SEQ ERROR
 004672  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
 004676  012767  004706  173124          MOV     #RETC3,RTRAP3   ;RTURN FROM TRAP POINTER
 004704  104000                          EMT                     ;TRAP ON THIS INSTRICTION
 004706  022767  004706  173560  RETC3:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
 004714  001405                          BEQ     TST30
 004716  012737  000116  000402          MOV     #116,@#$FATAL   ;MOVE TO MAILBOX #  *******  116  *******
 004724  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 004726  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TESTN
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 760
```

```

                                        ;*************************************************************************************
                                        ;TEST 30        TEST  THAT "OLD" STATUS AND PRIORITY ARE PLACED ON STACK
                                        ;*************************************************************************************
004730  005237  000404                  TST30:  INC     @#$TESTN        ;UPDATE TEST NUMBER
004734  022737  000030  000404                  CMP     #30,@#$TESTN    ;SEQUENCE ERROR?
004742  001044                                  BNE     TST31-12        ;BR TO ERROR HALT ON SEQ ERROR
004744  012706  000500                          MOV     #BUFF,SP        ;SET UP
004750  012767  004772  173052                  MOV     #RETD3,RTRAP3   ;SET UP
004756  005067  006134                          CLR     STATUS          ;CLEAR STATUS AND PRIORITY
004762  106437                                  .WORD   106437
004764  013116                                  .WORD   STATUS
004766  000257                                  CCC
004770  104000                                  EMT                     ;TRAP
004772  026727  173500  000000          RETD3:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
005000  001405                                  BEQ     1$
005002  012737  000117  000402                  MOV     #117,@#$FATAL   ;MOVE TO MAILBOX #  *******  117  *******
005010  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
005012  000000                                  HALT                    ;INCORRECT STATUS
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 753
005014  012706  000500                  1$:     MOV     #BUFF,SP        ;SET UP
005020  012767  005044  173002                  MOV     #RETE3,RTRAP3   ;SET UP
005026  012767  000357  006062                  MOV     #357,STATUS             ;SET PRIORITY
005034  106437                                  .WORD   106437
005036  013116                                  .WORD   STATUS
005040  000277                                  SCC                     ;SET CC
005042  104000                                  EMT                     ;TRAP
005044  026727  173426  000357          RETE3:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
005052  001405                                  BEQ     TST31
005054  012737  000120  000402                  MOV     #120,@#$FATAL   ;MOVE TO MAILBOX #  *******  120  *******
005062  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
005064  000000                                  HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 726
```

```
 861
 862                                               ;********************** *************************************************************
 (2)                                               ;TEST 31          TEST  THAT "NEW" STATUS IS CORRECT
 (3)                                               ;*******************************************************************************************
 (2)  005066  005237  000404                       TST31:   INC     @#$TESTN            ;UPDATE TEST NUMBER
 (2)  005072  022737  000031  000404                        CMP     #31,@#$TESTN        ;SEQUENCE ERROR?
 (2)  005100  001125                                        BNE     TST32-12            ;BR TO ERROR HALT ON SEQ ERROR
 863  005102  012706  000500                                MOV     #BUFF,SP
 864  005106  012767  005122  172714                        MOV     #RETF3,RTRAP3
 865  005114  005067  172712                                CLR     RTRAP3+2            ;CLEAR FUTURE PRIORITY AND CC
 866  005120  104000                                        EMT
 867  005122                                       RETF3:                               ;TEST FOR "C" CLEARED
 868  005122  100005                                        BPL     1$
 (3)  005124  012737  000121  000402                        MOV     #121,@#$FATAL       ;MOVE TO MAILBOX #  *******  121  *******
 (2)  005132  005212                                        INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (2)  005134  000000                                        HALT                        ;C NOT CLEARED
 (4)                                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                                    ; AND REPLACE NEXT INST W/ 761
 869  005136                                       1$:
 (1)  005136  001005                                        BNE     2$
 (3)  005140  012737  000122  000402                        MOV     #122,@#$FATAL       ;MOVE TO MAILBOX #  *******  122  *******
 (2)  005146  005212                                        INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (2)  005150  000000                                        HALT                        ;Z NOT CLEARED
 (4)                                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                                    ; AND REPLACE NEXT INST W/ 753
 870  005152                                       2$:
 (1)  005152  102005                                        BVC     3$
 (3)  005154  012737  000123  000402                        MOV     #123,@#$FATAL       ;MOVE TO MAILBOX #  *******  123  *******
 (2)  005162  005212                                        INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (2)  005164  000000                                        HALT                        ;V NOT CLEARED
 (4)                                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                                    ; AND REPLACE NEXT INST W/ 745
 871  005166                                       3$:
 (1)  005166  103005                                        BCC     4$
 (3)  005170  012737  000124  000402                        MOV     #124,@#$FATAL       ;MOVE TO MAILBOX #  *******  124  *******
 (2)  005176  005212                                        INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (2)  005200  000000                                        HALT                        ;C NOT CLEARED
 (4)                                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                                    ; AND REPLACE NEXT INST W/ 737
 872  005202                                       4$:
 (1)  005202  106737                                        .WORD   106737
 (1)  005204  013116                                        .WORD   STATUS
 873  005206  032767  000340  005702                        BIT     #340,STATUS                 ;TEST PRIORITY
 874  005214  001405                                        BEQ     5$
 (3)  005216  012737  000125  000402                        MOV     #125,@#$FATAL       ;MOVE TO MAILBOX #  *******  125  *******
 (2)  005224  005212                                        INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (2)  005226  000000                                        HALT                        ;PRIORITY NOT ZERO
 (4)                                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                                    ; AND REPLACE NEXT INST W/ 724
 875  005230  012706  000500                       5$:      MOV     #BUFF,SP
 876  005234  012767  005252  172566                        MOV     #RETG3,RTRAP3
 877  005242  012767  000357  172562                        MOV     #357,RTRAP3+2       ;SET NEW "CC" AND PRIORITY
 878  005250  104000                                        EMT                         ;TRAP HERE
 879  005252                                       RETG3:
```

```
  880  005252  100405                          BMI     1$
  (3)  005254  012737  000126  000402          MOV     #126,@#$FATAL   ;MOVE TO MAILBOX #  *******  126  *******
  (2)  005262  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  005264  000000                          HALT                    ;N NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 705
  881  005266                          1$:
  (1)  005266  001405                          BEQ     2$
  (3)  005270  012737  000127  000402          MOV     #127,@#$FATAL   ;MOVE TO MAILBOX #  *******  127  *******
  (2)  005276  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  005300  000000                          HALT                    ;Z NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 677
  882  005302                          2$:
  (1)  005302  102405                          BVS     3$
  (3)  005304  012737  000130  000402          MOV     #130,@#$FATAL   ;MOVE TO MAILBOX #  *******  130  *******
  (2)  005312  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  005314  000000                          HALT                    ;V NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 671
  883  005316                          3$:
  (1)  005316  103405                          BCS     4$
  (3)  005320  012737  000131  000402          MOV     #131,@#$FATAL   ;MOVE TO MAILBOX #  *******  131  *******
  (2)  005326  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  005330  000000                          HALT                    ;C NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 663
  884  005332                          4$:
  (1)  005332  106737                          .WORD   106737
  (1)  005334  013116                          .WORD   STATUS
  885  005336  016706  005554                  MOV     STATUS,SP
  886  005342  042706  000017                  BIC     #17,SP
  887  005346  022706  000340                  CMP     #340,SP
  888  005352  001405                          BEQ     TST32
  (4)  005354  012737  000132  000402          MOV     #132,@#$FATAL   ;MOVE TO MAILBOX #  *******  132  *******
  (3)  005362  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (3)  005364  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
  (5)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (5)                                                                  ; AND REPLACE NEXT INST W/ 645
```

```
                                     ;*********************************************************************
                                     ;TEST 32         TEST  THAT ALL COMBINATION OF EMT WILL CAUSE A TRAP
                                     ;*********************************************************************
 005366  005237  000404              TST32:  INC     @#$TESTN          ;UPDATE TEST NUMBER
 005372  022737  000032  000404              CMP     #32,@#$TESTN      ;SEQUENCE ERROR?
 005400  001011                              BNE     RBBB              ;BR TO ERROR HALT ON SEQ ERROR
 005402  012767  104000  000012              MOV     #EMT,RB           ;INITIALIZE BASE EMT INSTRUCTION
 005410  012767  005436  172412              MOV     #RA,30            ;RETURN FROM TRAP TO RA
 005416  012706  000500              RC:     MOV     #BUFF,SP          ;SET UP STACK POINTER
 005422  104000                      RB:     EMT                       ;TRAP INST. WILL BE MODIFIED TO EMT+377
 005424                              RBBB:
 005424  012737  000133  000402              MOV     #133,@#$FATAL     ;MOVE TO MAILBOX #  *******  133  *******
 005432  005212                              INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 005434  000000                              HALT                      ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TESTN
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 761
 005436  005267  177760              RA:     INC     RB
 005442  022767  104377  177752              CMP     #104377,RB        ;EMT+377 TO EMT?
 005450  103362                              BHIS    RC                ;HAVE WE TESTED ALL
 005452  012767  000032  172350              MOV     #32,30
 005460  005067  172346                      CLR     32                ;HALT
                                     ;*********************************************************************
                                     ;TEST 33         TEST  THAT A TRAP OCCURES ON AN 'BPT'' INSTRUCTION
                                     ;*********************************************************************
 005464  005237  000404              TST33:  INC     @#$TESTN          ;UPDATE TEST NUMBER
 005470  022737  000033  000404              CMP     #33,@#$TESTN      ;SEQUENCE ERROR?
 005476  001006                              BNE     TST34-12          ;BR TO ERROR HALT ON SEQ ERROR
 005500  012706  000500                      MOV     #BUFF,SP          ;STACK POINTER SETUP
 005504  012767  005526  172302              MOV     #RETA4,RTRAP4     ;RETURN LOCATI^^
 005512  000003                              TRT                       ;RESERVED INSTI.JCTION, SHOULD TRAP
 005514  012737  000134  000402              MOV     #134,@#$FATAL     ;MOVE TO MAILBOX #  *******  134  *******
 005522  005212                              INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 005524  000000                              HALT                      ;DID NOT TRAP,OR WRONG $TESTN
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 764
 005526                              RETA4:
```

```
 909
 910                                      ;******************************************************************************
 (2)                                      ;TEST 34         TEST  DECREMENT OF STACK POINTER ON A TRAP OPERATION
 (3)                                      ;******************************************************************************
 (2)  005526  005237  000404              TST34:  INC     @#$TESTN           ;UPDATE TEST NUMBER
 (2)  005532  022737  000034  000404              CMP     #34,@#$TESTN       ;SEQUENCE ERROR?
 (2)  005540  001011                              BNE     TST35-12           ;BR TO ERROR HALT ON SEQ ERROR
 911  005542  012706  000500                      MOV     #BUFF,SP           ;STACK POINTER SETUP
 912  005546  012767  005556  172240              MOV     #RETB4,RTRAP4      ;RETURN POINTER
 913  005554  000003                              TRT                        ;RESERVED INSTRUCTION
 914  005556  020627  000474              RETB4:  CMP     SP,#BUFF-4         ;TEST DECREMENT OF SP
 915  005562  001405                              BEQ     TST35
 (4)  005564  012737  000135  000402              MOV     #135,@#$FATAL      ;MOVE TO MAILBOX #  *******  135  *******
 (3)  005572  005212                              INC     (R2)               ;SET MSGTYP TO FATAL ERROR
 (3)  005574  000000                              HALT                       ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
 (5)                                                                         ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                         ; AND REPLACE NEXT INST W/ 761
 916                                      ;******************************************************************************
 (2)                                      ;TEST 35         TEST  THAT PROPER P.C. IS SAVED
 (3)                                      ;******************************************************************************
 (2)  005576  005237  000404              TST35:  INC     @#$TESTN           ;UPDATE TEST NUMBER
 (2)  005602  022737  000035  000404              CMP     #35,@#$TESTN       ;SEQUENCE ERROR?
 (2)  005610  001012                              BNE     TST36-12           ;BR TO ERROR HALT ON SEQ ERROR
 917  005612  012706  000500                      MOV     #BUFF,SP           ;STACK POINTER SETUP
 918  005616  012767  005626  172170              MOV     #RETC4,RTRAP4      ;RETURN FROM TRAP POINTER
 919  005624  000003                              TRT                        ;TRAP ON THIS INSTRUCTION
 920  005626  022767  005626  172640      RETC4:  CMP     #.,BUFF-4          ;CHECK FOR INCREMENTED P.C.
 921  005634  001405                              BEQ     TST36
 (4)  005636  012737  000136  000402              MOV     #136,@#$FATAL      ;MOVE TO MAILBOX #  *******  136  *******
 (3)  005644  005212                              INC     (R2)               ;SET MSGTYP TO FATAL ERROR
 (3)  005646  000000                              HALT                       ;INCORRECT P.C.,OR WRONG $TESTN
 (5)                                                                         ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                         ; AND REPLACE NEXT INST W/ 760
```

```
923
924                                     ;*********************************************************************************
(2)                                     ;TEST 36        TEST  THAT 'OLD'' STATUS AND PRIORITY ARE PLACED ON STACK
(3)                                     ;*********************************************************************************
(2)  005650  005237  000404            TST36:  INC     @#$TESTN        ;UPDATE TEST NUMBER
(2)  005654  022737  000036  000404            CMP     #36,@#$TESTN    ;SEQUENCE ERROR?
(2)  005662  001044                            BNE     TST37-12        ;BR TO ERROR HALT ON SEQ ERROR
925  005664  012706  000500                    MOV     #BUFF,SP        ;SET UP
926  005670  012767  005712  172116            MOV     #RETD4,RTRAP4   ;SET UP
927  005676  005067  005214                    CLR     STATUS          ;CLEAR STATUS AND PRIORITY
928  005702  106437                            .WORD   106437
(1)  005704  013116                            .WORD   STATUS
929  005706  000257                            CCC
930  005710  000003                            TRT                     ;TRAP
931  005712  026727  172560  000000  RETD4:    CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
932  005720  001405                            BEQ     1$
(3)  005722  012737  000137  000402            MOV     #137,@#$FATAL   ;MOVE TO MAILBOX #  *******  137  *******
(2)  005730  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  005732  000000                            HALT                    ;INCORRECT STATUS
(4)                                                                     ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                     ; AND REPLACE NEXT INST W/ 753
933  005734  012706  000500            1$:     MOV     #BUFF,SP        ;SET UP
934  005740  012767  005764  172046            MOV     #RETE4,RTRAP4   ;SET UP
935  005746  012767  000357  005142            MOV     #357,STATUS             ;SET PRIORITY
936  005754  106437                            .WORD   106437
(1)  005756  013116                            .WORD   STATUS
937  005760  000277                            SCC                     ;SET-SET CC
938  005762  000003                            TRT                     ;TRAP
939  005764  026727  172506  000357  RETE4:    CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
940  005772  001405                            BEQ     TST37
(4)  005774  012737  000140  000402            MOV     #140,@#$FATAL   ;MOVE TO MAILBOX #  *******  140  *******
(3)  006002  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(3)  006004  000000                            HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
(5)                                                                     ; TO SCOPE REPLACE HALT W/ 240
(5)                                                                     ; AND REPLACE NEXT INST W/ 726
```

```
                                        ;********************** ******************************************************
                                        ;TEST 37          TEST  THAT "NEW" STATUS IS CORRECT
                                        ;*****************************************************************************
006006  005237  000404                  TST37:  INC     @#$TESTN        ;UPDATE TEST NUMBER
006012  022737  000037  000404                  CMP     #37,@#$TESTN    ;SEQUENCE ERROR?
006020  001125                                  BNE     RSTP2           ;BR TO ERROR HALT ON SEQ ERROR
006022  012706  000500                          MOV     #BUFF,SP
006026  012767  006042  171760                  MOV     #RETF4,RTRAP4
006034  005067  171756                          CLR     RTRAP4+2        ;CLEAR FUTURE PRIORITY AND CC
006040  000003                                  TRT
006042                                  RETF4:
006042  100005                                  BPL     1$
006044  012737  000141  000402                  MOV     #141,@#$FATAL   ;MOVE TO MAILBOX #  *******  141  *******
006052  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006054  000000                                  HALT                    ;C NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 761
006056                                  1$:
006056  001005                                  BNE     2$
006060  012737  000142  000402                  MOV     #142,@#$FATAL   ;MOVE TO MAILBOX #  *******  142  *******
006066  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006070  000000                                  HALT                    ;Z NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 753
006072                                  2$:
006072  102005                                  BVC     3$
006074  012737  000143  000402                  MOV     #143,@#$FATAL   ;MOVE TO MAILBOX #  *******  143  *******
006102  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006104  000000                                  HALT                    ;V NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 745
006106                                  3$:
006106  103005                                  BCC     4$
006110  012737  000144  000402                  MOV     #144,@#$FATAL   ;MOVE TO MAILBOX #  *******  144  *******
006116  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006120  000000                                  HALT                    ;C NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 737
006122                                  4$:
006122  106737                                  .WORD   106737
006124  013116                                  .WORD   STATUS
006126  032767  000340  004762                  BIT     #340,STATUS             ;TEST PRIORITY
006134  001405                                  BEQ     5$
006136  012737  000145  000402                  MOV     #145,@#$FATAL   ;MOVE TO MAILBOX #  *******  145  *******
006144  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
006146  000000                                  HALT                    ;PRIORITY NOT ZERO
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 724
006150  012706  000500                  5$:     MOV     #BUFF,SP
006154  012767  006172  171632                  MOV     #RETG4,RTRAP4
006162  012767  000357  171626                  MOV     #357,RTRAP4+2   ;SET NEW "CC" AND PRIORITY
006170  000003                                  TRT                     ;TRAP HERE
006172                                  RETG4:
```

```
961  006172  100405                        BMI     1$
(3)  006174  012737  000146  000402        MOV     #146,@#$FATAL   ;MOVE TO MAILBOX # ******* 146 *******
(2)  006202  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  006204  000000                        HALT                    ;N NOT SET
(4)                                                                ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                ; AND REPLACE NEXT INST W/ 705
962  006206                        1$:
(1)  006206  001405                        BEQ     2$
(3)  006210  012737  000147  000402        MOV     #147,@#$FATAL   ;MOVE TO MAILBOX # ******* 147 *******
(2)  006216  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  006220  000000                        HALT                    ;Z NOT SET
(4)                                                                ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                ; AND REPLACE NEXT INST W/ 677
963  006222                        2$:
(1)  006222  102405                        BVS     3$
(3)  006224  012737  000150  000402        MOV     #150,@#$FATAL   ;MOVE TO MAILBOX # ******* 150 *******
(2)  006232  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  006234  000000                        HALT                    ;V NOT SET
(4)                                                                ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                ; AND REPLACE NEXT INST W/ 671
964  006236                        3$:
(1)  006236  103405                        BCS     4$
(3)  006240  012737  000151  000402        MOV     #151,@#$FATAL   ;MOVE TO MAILBOX # ******* 151 *******
(2)  006246  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  006250  000000                        HALT                    ;C NOT SET
(4)                                                                ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                ; AND REPLACE NEXT INST W/ 663
965  006252                        4$:
(1)  006252  106737                        .WORD   106737
(1)  006254  013116                        .WORD   STATUS
966  006256  016706  004634                MOV     STATUS,SP
967  006262  042706  000017                BIC     #17,SP
968  006266  022706  000340                CMP     #340,SP
969  006272  001405                        BEQ     RST2
(1)  006274                        RSTP2:
(3)  006274  012737  000152  000402        MOV     #152,@#$FATAL   ;MOVE TO MAILBOX # ******* 152 *******
(2)  006302  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2)  006304  000000                        HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
(4)                                                                ; TO SCOPE REPLACE HALT W/ 240
(4)                                                                ; AND REPLACE NEXT INST W/ 645
970  006306  012767  000016  171500  RST2:  MOV     #16,14
971  006314  005067  171476                CLR     16
972
```

```
                                        ;PDP-11 ILLEGAL AND ADDRESS INSTRUCTION TEST
                                        ;ALL INSTRUCTIONS THAT ARE RESERVED
                                        ;SHOULD TRAP TO LOCATION 4, AND THE
                                        ;PC THAT POINTS TO THE TRAPPING INSTRUCTION
                                        ;SHOULD BE PLACED ON THE STACK

                                        ;*****************************************************************************
(2)                                     ;TEST 40        TEST  THAT A TRAP OCCURS ON AN ILLEGAL INSTRUCTION
(3)                                     ;*****************************************************************************
(2) 006320 005237 000404        TST40:  INC     @#$TESTN        ;UPDATE TEST NUMBER
(2) 006324 022737 000040 000404         CMP     #40,@#$TESTN    ;SEQUENCE ERROR?
(2) 006332 001006                       BNE     TST41-12        ;BR TO ERROR HALT ON SEQ ERROR
982 006334 012706 000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
983 006340 012767 006362 171436         MOV     #RETA5,RTRAP5   ;RETURN LOCATION
984 006346 000100                       JMP     %0              ;ILLEGAL INSTRUCTION, SHOULD TRAP
985 006350 012737 000153 000402         MOV     #153,@#$FATAL   ;MOVE TO MAILBOX #  *******  153  *******
(2) 006356 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(2) 006360 000000                       HALT                    ;DID NOT TRAP,OR WRONG $TESTN
(4)                                                             ; TO SCOPE REPLACE HALT W/ 240
(4)                                                             ; AND REPLACE NEXT INST W/ 764
986 006362                      RETA5:
                                        ;*****************************************************************************
(2)                                     ;TEST 41        TEST  DECREMENT OF STACK POINTER ON A TRAP OPERATION
(3)                                     ;*****************************************************************************
(2) 006362 005237 000404        TST41:  INC     @#$TESTN        ;UPDATE TEST NUMBER
(2) 006366 022737 000041 000404         CMP     #41,@#$TESTN    ;SEQUENCE ERROR?
(2) 006374 001011                       BNE     TST42-12        ;BR TO ERROR HALT ON SEQ ERROR
988 006376 012706 000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
989 006402 012767 006412 171374         MOV     #RETB5,RTRAP5   ;RETURN POINTER
990 006410 000100                       JMP     %0              ;RESERVED INSTRUCTION
991 006412 020627 000474        RETB5:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
992 006416 001405                       BEQ     TST42
(4) 006420 012737 000154 000402         MOV     #154,@#$FATAL   ;MOVE TO MAILBOX #  *******  154  *******
(3) 006426 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
(3) 006430 000000                       HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
(5)                                                             ; TO SCOPE REPLACE HALT W/ 240
(5)                                                             ; AND REPLACE NEXT INST W/ 761
```

```
                                                 ;*********************************************************************************
                                                 ;TEST 42          TEST  THAT PROPER P.C. IS SAVED
                                                 ;*********************************************************************************
006432  005237  000404                           TST42:  INC     @#$TESTN         ;UPDATE TEST NUMBER
006436  022737  000042  000404                           CMP     #42,@#$TESTN     ;SEQUENCE ERROR?
006444  001012                                           BNE     TST43-12         ;BR TO ERROR HALT ON SEQ ERROR
006446  012706  000500                                   MOV     #BUFF,SP         ;STACK POINTER SETUP
006452  012767  006462  171324                           MOV     #RETC5,RTRAP5    ;RETURN FROM TRAP POINTER
006460  000100                                           JMP     %0               ;TRAP ON THIS INSTRUCTION
006462  022767  006462  172004           RETC5:  CMP     #.,BUFF-4        ;CHECK FOR INCREMENTED P.C.
006470  001405                                           BEQ     TST43
006472  012737  000155  000402                           MOV     #155,@#$FATAL    ;MOVE TO MAILBOX #  *******  155  *******
006500  005212                                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
006502  000000                                           HALT                     ;INCORRECT P.C.,OR WRONG $TESTN
                                                                                  ; TO SCOPE REPLACE HALT W/ 240
                                                                                  ; AND REPLACE NEXT INST W/ 760
                                                 ;*********************************************************************************
                                                 ;TEST 43          TEST  THAT "OLD" STATUS AND PRIORITY ARE PLACED ON STACK
                                                 ;*********************************************************************************
006504  005237  000404                           TST43:  INC     @#$TESTN         ;UPDATE TEST NUMBER
006510  022737  000043  000404                           CMP     #43,@#$TESTN     ;SEQUENCE ERROR?
006516  001044                                           BNE     TST44-12         ;BR TO ERROR HALT ON SEQ ERROR
006520  012706  000500                                   MOV     #BUFF,SP         ;SET UP
006524  012767  006546  171252                           MOV     #RETD5,RTRAP5    ;SET UP
006532  005067  004360                                   CLR     STATUS           ;CLEAR STATUS AND PRIORITY
006536  106437                                           .WORD   106437
006540  013116                                           .WORD   STATUS
006542  000257                                           CCC
006544  000100                                           JMP     %0               ;TRAP
006546  026727  171724  000000           RETD5:  CMP     BUFF-2,#0        ;TEST THAT OLD STATUS WENT TO STACK
006554  001405                                           BEQ     1$
006556  012737  000156  000402                           MOV     #156,@#$FATAL    ;MOVE TO MAILBOX #  *******  156  *******
006564  005212                                           INC     (R2)             ;SET MSGTYP TO FATAL ERROR
006566  000000                                           HALT                     ;INCORRECT STATUS
                                                                                  ; TO SCOPE REPLACE HALT W/ 240
                                                                                  ; AND REPLACE NEXT INST W/ 753
006570  012706  000500                   1$:     MOV     #BUFF,SP         ;SET UP
006574  012767  006620  171202                   MOV     #RETE5,RTRAP5    ;SET UP
006602  012767  000357  004306                   MOV     #357,STATUS              ;SET PRIORITY
006610  106437                                   .WORD   106437
006612  013116                                   .WORD   STATUS
006614  000277                                   SCC                      ;SET CC
006616  000100                                   JMP     %0               ;TRAP
006620  026727  171652  000357           RETE5:  CMP     BUFF-2,#357      ;COMPARES STATUS ON STACK
006626  001405                                   BEQ     TST44
006630  012737  000157  000402                   MOV     #157,@#$FATAL    ;MOVE TO MAILBOX #  *******  157  *******
006636  005212                                   INC     (R2)             ;SET MSGTYP TO FATAL ERROR
006640  000000                                   HALT                     ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 726
```

```
 1019
 1020                                   ;********************************************************************************
  (2)                                   ;TEST 44        TEST  THAT "NEW" STATUS IS CORRECT
  (3)                                   ;********************************************************************************
  (2) 006642  005237  000404            TST44:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2) 006646  022737  000044  000404            CMP     #44,@#$TESTN    ;SEQUENCE ERROR?
  (2) 006654  001123                            BNE     TST45-12        ;BR TO ERROR HALT ON SEQ ERROR
 1021 006656  012706  000500                    MOV     #BUFF,SP
 1022 006662  012767  006676  171114            MOV     #RETF5,RTRAP5
 1023 006670  005067  171112                    CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
 1024 006674  000100                            JMP     %0
 1025 006676                            RETF5:
 1026 006676  100005                            BPL     1$
  (3) 006700  012737  000160  000402            MOV     #160,@#$FATAL   ;MOVE TO MAILBOX #  *******  160  *******
  (2) 006706  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 006710  000000                            HALT                    ;C NOT CLEARED
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 761
 1027 006712                            1$:
  (1) 006712  001005                            BNE     2$
  (3) 006714  012737  000161  000402            MOV     #161,@#$FATAL   ;MOVE TO MAILBOX #  *******  161  *******
  (2) 006722  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 006724  000000                            HALT                    ;Z NOT CLEARED
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 753
 1028 006726                            2$:
  (1) 006726  102005                            BVC     3$
  (3) 006730  012737  000162  000402            MOV     #162,@#$FATAL   ;MOVE TO MAILBOX #  *******  162  *******
  (2) 006736  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 006740  000000                            HALT                    ;V NOT CLEARED
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 745
 1029 006742                            3$:
  (1) 006742  103005                            BCC     4$
  (3) 006744  012737  000163  000402            MOV     #163,@#$FATAL   ;MOVE TO MAILBOX #  *******  163  *******
  (2) 006752  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 006754  000000                            HALT                    ;C NOT CLEARED
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 737
 1030 006756                            4$:
  (1) 006756  106737                            .WORD   106737
  (1) 006760  013116                            .WORD   STATUS
 1031 006762  032767  000357  004126            BIT     #357,STATUS             ;TEST PRIORITY
 1032 006770  001405                            BEQ     5$
  (3) 006772  012737  000164  000402            MOV     #164,@#$FATAL   ;MOVE TO MAILBOX #  *******  164  *******
  (2) 007000  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 007002  000000                            HALT                    ;PRIORITY NOT ZERO
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 724
 1033 007004  012706  000500            5$:     MOV     #BUFF,SP
 1034 007010  012767  007026  170766            MOV     #RETG5,RTRAP5
 1035 007016  012767  000357  170762            MOV     #357,RTRAP5+2   ;SET NEW "CC" AND PRIORITY
 1036 007024  000100                            JMP     %0              ;TRAP HERE
 1037 007026                            RETG5:
```

```
 1038  007026  100405                          BMI     1$
  (3)  007030  012737  000165  000402          MOV     #165,@#$FATAL   ;MOVE TO MAILBOX #  *******  165  *******
  (2)  007036  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007040  000000                          HALT                    ;N NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 705
 1039  007042                          1$:
  (1)  007042  001405                          BEQ     2$
  (3)  007044  012737  000166  000402          MOV     #166,@#$FATAL   ;MOVE TO MAILBOX #  *******  166  *******
  (2)  007052  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007054  000000                          HALT                    ;Z NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 677
 1040  007056                          2$:
  (1)  007056  102405                          BVS     3$
  (3)  007060  012737  000167  000402          MOV     #167,@#$FATAL   ;MOVE TO MAILBOX #  *******  167  *******
  (2)  007066  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007070  000000                          HALT                    ;V NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 671
 1041  007072                          3$:
  (1)  007072  103405                          BCS     4$
  (3)  007074  012737  000170  000402          MOV     #170,@#$FATAL   ;MOVE TO MAILBOX #  *******  170  *******
  (2)  007102  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007104  000000                          HALT                    ;C NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 663
 1042  007106                          4$:
  (1)  007106  106737                          .WORD   106737
  (1)  007110  013116                          .WORD   STATUS
 1043  007112  016706  004000                  MOV     STATUS,SP
 1044  007116  022706  000357                  CMP     #357,SP
 1045  007122  001405                          BEQ     TST45
  (4)  007124  012737  000171  000402          MOV     #171,@#$FATAL   ;MOVE TO MAILBOX #  *******  171  *******
  (3)  007132  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (3)  007134  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
  (5)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (5)                                                                  ; AND REPLACE NEXT INST W/ 647
```

```
 1047
 1048                                   ;*********************************************************************************
  (2)                                   ;TEST 45        TEST  THAT A TRAP OCCURES ON ALL ILLEGAL INSTRUCION
  (3)                                   ;*********************************************************************************
  (2) 007136 005237 000404       TST45:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2) 007142 022737 000045 000404        CMP     #45,@#$TESTN    ;SEQUENCE ERROR?
  (2) 007150 001006                      BNE     TST46-12        ;BR TO ERROR HALT ON SEQ ERROR
 1049 007152 012706 000500               MOV     #BUFF,SP        ;STACK POINTER SETUP
 1050 007156 012767 007200 170620        MOV     #RETH5,RTRAPS   ;RETURN LOCATION
 1051 007164 004000                      JSR     %0,%0           ;RESERVED INSTRUCTION, SHOULD TRAP
 1052 007166 012737 000172 000402        MOV     #172,@#$FATAL   ;MOVE TO MAILBOX #  *******  172  *******
  (2) 007174 005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 007176 000000                      HALT                    ;DID NOT TRAP,OR WRONG $TESTN
  (4)                                                            ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                            ; AND REPLACE NEXT INST W/ 764
 1053 007200                     RETH5:
 1054                                   ;*********************************************************************************
  (2)                                   ;TEST 46        TEST  DECREMENT OF STACK POINTER ON A TRAP OPERATION
  (3)                                   ;*********************************************************************************
  (2) 007200 005237 000404       TST46:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2) 007204 022737 000046 000404        CMP     #46,@#$TESTN    ;SEQUENCE ERROR?
  (2) 007212 001011                      BNE     TST47-12        ;BR TO ERROR HALT ON SEQ ERROR
 1055 007214 012706 000500               MOV     #BUFF,SP        ;STACK POINTER SETUP
 1056 007220 012767 007230 170556        MOV     #RETJ,RTRAPS    ;RETURN POINTER
 1057 007226 004000                      JSR     %0,%0           ;RESERVED INSTRUCTION
 1058 007230 020627 000474       RETJ:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
 1059 007234 001405                      BEQ     TST47
  (4) 007236 012737 000173 000402        MOV     #173,@#$FATAL   ;MOVE TO MAILBOX #  *******  173  *******
  (3) 007244 005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (3) 007246 000000                      HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TESTN
  (5)                                                            ; TO SCOPE REPLACE HALT W/ 240
  (5)                                                            ; AND REPLACE NEXT INST W/ 761
```

```

                                        ;*********************** ***********************************************************
                                        ;TEST 47        TEST  THAT PROPER P.C. IS SAVED
                                        ;**********************************************************************************
007250  005237  000404                  TST47:  INC     @#$TESTN          ;UPDATE TEST NUMBER
007254  022737  000047  000404                  CMP     #47,@#$TESTN      ;SEQUENCE ERROR?
007262  001012                                  BNE     TST50-12          ;BR TO ERROR HALT ON SEQ ERROR
007264  012706  000500                          MOV     #BUFF,SP          ;STACK POINTER SETUP
007270  012767  007300  170506                  MOV     #RETK,RTRAP5      ;RETURN FROM TRAP POINTER
007276  004000                          INSTK:  JSR     %0,%0             ;TRAP ON THIS INSTRUCTION
007300  022767  007300  171166          RETK:   CMP     #INSTK+2,BUFF-4 ;CHECK FOR INCREMENED P.C.
007306  001405                                  BEQ     TST50
007310  012737  000174  000402                  MOV     #174,@#$FATAL     ;MOVE TO MAILBOX #  *******  174  *******
007316  005212                                  INC     (R2)              ;SET MSGTYP TO FATAL ERROR
007320  000000                                  HALT                      ;INCORRECT P.C.,OR WRONG $TESTN
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 760

                                        ;**********************************************************************************
                                        ;TEST 50        TEST  THAT ''OLD'' STATUS AND PRIORITY ARE PLACED ON STACK
                                        ;**********************************************************************************
007322  005237  000404                  TST50:  INC     @#$TESTN          ;UPDATE TEST NUMBER
007326  022737  000050  000404                  CMP     #50,@#$TESTN      ;SEQUENCE ERROR?
007334  001044                                  BNE     TST51-12          ;BR TO ERROR HALT ON SEQ ERROR
007336  012706  000500                          MOV     #BUFF,SP          ;SET UP
007342  012767  007364  170434                  MOV     #RETL,RTRAP5      ;SET UP
007350  005067  003542                          CLR     STATUS            ;CLEAR STATUS AND PRIORITY
007354  106437                                  .WORD   106437
007356  013116                                  .WORD   STATUS
007360  000257                                  CCC
007362  004000                                  JSR     %0,%0             ;TRAP
007364  026727  171106  000000          RETL:   CMP     BUFF-2,#0         ;TEST THAT OLD STATUS WENT TO STACK
007372  001405                                  BEQ     1$
007374  012737  000175  000402                  MOV     #175,@#$FATAL     ;MOVE TO MAILBOX #  *******  175  *******
007402  005212                                  INC     (R2)              ;SET MSGTYP TO FATAL ERROR
007404  000000                                  HALT                      ;INCORRCT STATUS
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 753
007406  012706  000500                  1$:     MOV     #BUFF,SP          ;SET UP
007412  012767  007436  170364                  MOV     #RETM,RTRAP5      ;SET UP
007420  012767  000357  003470                  MOV     #357,STATUS               ;SET PRIORITY
007426  106437                                  .WORD   106437
007430  013116                                  .WORD   STATUS
007432  000277                                  SCC                       ;SET CC
007434  004000                                  JSR     %0,%0             ;TRAP
007436  026727  171034  000357          RETM:   CMP     BUFF-2,#357       ;COMPARES STATUS ON STACK
007444  001405                                  BEQ     TST51
007446  012737  000176  000402                  MOV     #176,@#$FATAL     ;MOVE TO MAILBOX #  *******  176  *******
007454  005212                                  INC     (R2)              ;SET MSGTYP TO FATAL ERROR
007456  000000                                  HALT                      ;INCORRECT STATUS ON STACK,OR WRONG $TESTN
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 726

                                        ;**********************************************************************************
```

```
   (2)                                          ;TEST 51        TEST  THAT 'NEW' STATUS IS CORRECT
   (3)                                          ;****************** ********************************************************************
   (2)  007460  005237  000404                  TST51:  INC     @#$TESTN        ;UPDATE TEST NUMBER
   (2)  007464  022737  000051  000404                  CMP     #51,@#$TESTN    ;SEQUENCE ERROR?
   (2)  007472  001122                                  BNE     STP1            ;BR TO ERROR HALT ON SEQ ERROR
1088    007474  012706  000500                          MOV     #BUFF,SP
1089    007500  012767  007514  170276                  MOV     #RETN,RTRAP5
1090    007506  005067  170274                          CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
1091    007512  004000                                  JSR     %0,%0
1092    007514                                  RETN:                           ;TEST FOR "C" CLEARED
1093    007514  100005                                  BPL     1$
   (3)  007516  012737  000177  000402                  MOV     #177,@#$FATAL   ;MOVE TO MAILBOX #  *******  177  *******
   (2)  007524  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  007526  000000                                  HALT                    ;C NOT CLEARED
   (4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                          ; AND REPLACE NEXT INST W/ 761
1094    007530                                  1$:
   (1)  007530  001005                                  BNE     2$
   (3)  007532  012737  000200  000402                  MOV     #200,@#$FATAL   ;MOVE TO MAILBOX #  *******  200  *******
   (2)  007540  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  007542  000000                                  HALT                    ;Z NOT CLEARED
   (4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                          ; AND REPLACE NEXT INST W/ 753
1095    007544                                  2$:
   (1)  007544  102005                                  BVC     3$
   (3)  007546  012737  000201  000402                  MOV     #201,@#$FATAL   ;MOVE TO MAILBOX #  *******  201  *******
   (2)  007554  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  007556  000000                                  HALT                    ;V NOT CLEARED
   (4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                          ; AND REPLACE NEXT INST W/ 745
1096    007560                                  3$:
   (1)  007560  103005                                  BCC     4$
   (3)  007562  012737  000202  000402                  MOV     #202,@#$FATAL   ;MOVE TO MAILBOX #  *******  202  *******
   (2)  007570  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  007572  000000                                  HALT                    ;C NOT CLEARED
   (4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                          ; AND REPLACE NEXT INST W/ 737
1097    007574                                  4$:
   (1)  007574  106737                                  .WORD   106737
   (1)  007576  013116                                  .WORD   STATUS
1098    007600  016700  003312                          MOV     STATUS,%0       ;TEMP STORAGE
1099    007604  001405                                  BEQ     5$
   (3)  007606  012737  000203  000402                  MOV     #203,@#$FATAL   ;MOVE TO MAILBOX #  *******  203  *******
   (2)  007614  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  007616  000000                                  HALT                    ;PRIORITY NOT ZERO
   (4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                          ; AND REPLACE NEXT INST W/ 725
1100    007620  012706  000500                  5$:     MOV     #BUFF,SP
1101    007624  012767  007642  170152                  MOV     #RET0,RTRAP5
1102    007632  012767  000357  170146                  MOV     #357,RTRAP5+2   ;SET NEW "CC" AND PRIORITY
1103    007640  004000                                  JSR     %0,%0           ;TRAP HERE
1104    007642                                  RET0:
1105    007642  100405                                  BMI     1$
   (3)  007644  012737  000204  000402                  MOV     #204,@#$FATAL   ;MOVE TO MAILBOX #  *******  204  *******
```

```
  (2)  007652  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007654  000000                          HALT                    ;N NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 706
 1106  007656                               1$:
  (1)  007656  001405                          BEQ     2$
  (3)  007660  012737  000205  000402          MOV     #205,@#$FATAL   ;MOVE TO MAILBOX #  *******  205  *******
  (2)  007666  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007670  000000                          HALT                    ;Z NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 700
 1107  007672                               2$:
  (1)  007672  102405                          BVS     3$
  (3)  007674  012737  000206  000402          MOV     #206,@#$FATAL   ;MOVE TO MAILBOX #  *******  206  *******
  (2)  007702  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007704  000000                          HALT                    ;V NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 672
 1108  007706                               3$:
  (1)  007706  103405                          BCS     4$
  (3)  007710  012737  000207  000402          MOV     #207,@#$FATAL   ;MOVE TO MAILBOX #  *******  207  *******
  (2)  007716  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007720  000000                          HALT                    ;C NOT SET
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 664
 1109  007722                               4$:
  (1)  007722  106737                          .WORD   106737
  (1)  007724  013116                          .WORD   STATUS
 1110  007726  016700  003164                  MOV     STATUS,%0
 1111  007732  022700  000357                  CMP     #357,%0
 1112  007736  001405                          BEQ     STPBB
  (1)  007740                               STP1:
  (3)  007740  012737  000210  000402          MOV     #210,@#$FATAL   ;MOVE TO MAILBOX #  *******  210  *******
  (2)  007746  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  007750  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TESTN
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 650
 1113  007752  012767  000006  170024  STPBB:  MOV     #6,4
 1114  007760  005067  170022                  CLR     6
```

```
                                          ;*********************************************************************
                                          ;TEST 52        TEST  THAT THE TRACE TRAP: (BIT4 20(8)) WILL CAUSE A TRAP TO 14
                                          ;*********************************************************************
007764  005237  000404                    TST52:  INC     @#$TESTN        ;UPDATE TEST NUMBER
007770  022737  000052  000404                    CMP     #52,@#$TESTN    ;SEQUENCE ERROR?
007776  001013                                    BNE     TST53-12        ;BR TO ERROR HALT ON SEQ ERROR
010000  012706  000500                            MOV     #BUFF,SP
010004  012767  010040  170002                    MOV     #RETAT,RTRAP4   ;SET UP TO TRAP TO 14
010012  012746  000020                            MOV     #20,-(SP)       ;PUSH T BIT
010016  012746  010024                            MOV     #.+6,-(SP)      ;PUSH PC
010022  000002                                    RTI                     ;SET T BIT
010024  000240                                    NOP                     ;TRAP HERE
010026  012737  000211  000402                    MOV     #211,@#$FATAL   ;MOVE TO MAILBOX #  *******  211  *******
010034  005212                                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010036  000000                                    HALT                    ;TRACE BIT DID NOT TRAP!,OR WRONG $TESTN
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 757
010040                                    RETAT:
                                          ;*********************************************************************
                                          ;TEST 53        TEST  STACK POINTER DECREMENTS
                                          ;*********************************************************************
010040  005237  000404                    TST53:  INC     @#$TESTN        ;UPDATE TEST NUMBER
010044  022737  000053  000404                    CMP     #53,@#$TESTN    ;SEQUENCE ERROR?
010052  001023                                    BNE     TST54-12        ;BR TO ERROR HALT ON SEQ ERROR
010054  012706  000500                            MOV     #BUFF,SP
010060  012767  010114  167726                    MOV     #RETBT,RTRAP4
010066  012746  000020                            MOV     #20,-(SP)       ;PUSH T BIT
010072  012746  010100                            MOV     #.+6,-(SP)      ;PUSH PC
010076  000002                                    RTI                     ;SET T BIT
010100  000240                                    NOP                     ;TRAP HERE
010102  012737  000212  000402                    MOV     #212,@#$FATAL   ;MOVE TO MAILBOX #  *******  212  *******
010110  005212                                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010112  000000                                    HALT                    ;TRACE BIT DID NOT TRAP!
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 757
010114  020627  000474                    RETBT:  CMP     SP,#BUFF-4
010120  001405                                    BEQ     TST54
010122  012737  000213  000402                    MOV     #213,@#$FATAL   ;MOVE TO MAILBOX #  *******  213  *******
010130  005212                                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
010132  000000                                    HALT                    ;STACK POINTER WAS NOT PUSHED BY TRAP,OR WRONG $TESTN
                                                                          ; TO SCOPE REPLACE HALT W/ 240
                                                                          ; AND REPLACE NEXT INST W/ 747
```

```
1137
1138                                            ;*****************************************************************************
 (2)                                            ;TEST 54        TEST  FOR PROPER PC ON STACK
 (3)                                            ;*****************************************************************************
 (2)  010134  005237  000404                    TST54:  INC     @#$TESTN            ;UPDATE TEST NUMBER
 (2)  010140  022737  000054  000404                    CMP     #54,@#$TESTN        ;SEQUENCE ERROR?
 (2)  010146  001016                                    BNE     TST55-12            ;BR TO ERROR HALT ON SEQ ERROR
1139  010150  012706  000500                            MOV     #BUFF,SP
1140  010154  012767  010174  167632                    MOV     #RETCT,RTRAP4
1141  010162  012746  000020                            MOV     #20,-(SP)           ;PUSH T BIT
1142  010166  012746  010174                            MOV     #.+6,-(SP)          ;PUSH PC
1143  010172  000002                                    RTI                         ;SET T BIT
1144                                                                                ;TRAP HERE
1145  010174  022767  010174  170272    RETCT:  CMP     #.,BUFF-4
1146  010202  001405                                    BEQ     TST55
 (4)  010204  012737  000214  000402                    MOV     #214,@#$FATAL       ;MOVE TO MAILBOX #  *******  214  *******
 (3)  010212  005212                                    INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (3)  010214  000000                                    HALT                        ;CORRECT PC WAS NOT SAVED ON STACK,OR WRONG $TESTN
 (5)                                                                                ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                                ; AND REPLACE NEXT INST W/ 754
1147
1148
1149                                            ;*****************************************************************************
 (2)                                            ;TEST 55        TEST  THAT RTT POPS T- BIT
 (3)                                            ;*****************************************************************************
 (2)  010216  005237  000404                    TST55:  INC     @#$TESTN            ;UPDATE TEST NUMBER
 (2)  010222  022737  000055  000404                    CMP     #55,@#$TESTN        ;SEQUENCE ERROR?
 (2)  010230  001015                                    BNE     TST56-12            ;BR TO ERROR HALT ON SEQ ERROR
1150
1151  010232  012706  000500                            MOV     #BUFF,SP
1152  010236  005001                                    CLR     R1                  ;CLEAR R1
1153  010240  012746  000020                            MOV     #20,-(SP)
1154  010244  012746  010260                            MOV     #RTT1,-(SP)
1155  010250  012767  010276  167536                    MOV     #RTT2,14
1156  010256  000006                                    RTT
1157  010260  000240                        RTT1:   NOP
1158  010262  001405                                    BEQ     TST56
 (4)  010264  012737  000215  000402                    MOV     #215,@#$FATAL       ;MOVE TO MAILBOX #  *******  215  *******
 (3)  010272  005212                                    INC     (R2)                ;SET MSGTYP TO FATAL ERROR
 (3)  010274  000000                                    HALT                        ;T-BIT DID NOT TRAP,OR WRONG $TESTN
 (5)                                                                                ; TO SCOPE REPLACE HALT W/ 240
 (5)                                                                                ; AND REPLACE NEXT INST W/ 755
1159
1160  010276                                RTT2:
```

```
                                        ;*******************************************************************************
                                        ;TEST 56          TEST  THAT RTT ALLOWS ONE INST. BEFORE TRAP
 (2)                                    ;*******************************************************************************
 (3)
 (2)  010276  005237  000404            TST56:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 (2)  010302  022737  000056  000404            CMP     #56,@#$TESTN    ;SEQUENCE ERROR?
 (2)  010310  001031                            BNE     TST57-12        ;BR TO ERROR HALT ON SEQ ERROR
      010312  012705  177777                    MOV     #177777,%5
      010316  012706  000500            RTT5:   MOV     #BUFF,SP
      010322  012746  000020                    MOV     #20,-(SP)
      010326  012746  010344                    MOV     #RTT3,-(SP)
      010332  012767  010364  167454            MOV     #RTT4,14
      010340  005001                            CLR     R1              ;CLEAR R0
      010342  000006                            RTT                     ;SET T-BIT
      010344  005201                    RTT3:   INC     R1
      010346  005205                            INC     %5
      010350  001762                            BEQ     RTT5            ;DO THIS TEST NO MORE THAN 2 TIMES
      010352  012737  000216  000402            MOV     #216,@#$FATAL   ;MOVE TO MAILBOX #  *******  216  *******
 (2)  010360  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (2)  010362  000000                            HALT                    ;DID NOT TRAP
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 752
      010364  005301                    RTT4:   DEC     R1              ;SEE IF RTT ALLOWS 1 INST.
      010366  001407                            BEQ     RTT6
      010370  005205                            INC     %5              ;DO THIS TEST NO MORE THAN TWO TIMES
      010372  001751                            BEQ     RTT5
 (3)  010374  012737  000217  000402            MOV     #217,@#$FATAL   ;MOVE TO MAILBOX #  *******  217  *******
 (2)  010402  005212                            INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (2)  010404  000000                            HALT                    ;RTT DID NOT ALLOW 1 INST.,OR WRONG $TESTN
 (4)                                                                    ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                    ; AND REPLACE NEXT INST W/ 741
      010406                            RTT6:
```

```
                                     ;****************************************************************************
                                     ;TEST 57         TEST  THAT RTI DOES NOT ALLOW 1 INST.
                                     ;****************************************************************************
 010406  005237  000404              TST57:  INC     @#$TESTN          ;UPDATE TEST NUMBER
 010412  022737  000057  000404              CMP     #57,@#$TESTN      ;SEQUENCE ERROR?
 010420  001023                              BNE     TST60-12          ;BR TO ERROR HALT ON SEQ ERROR
 010422  012706  000500                      MOV     #BUFF,SP
 010426  012746  000020                      MOV     #20,-(SP)
 010432  012746  010450                      MOV     #RTI1,-(SP)
 010436  012767  010464  167350              MOV     #RTI2,14
 010444  005001                              CLR     R1
 010446  000002                              RTI                       ;SET T-BIT
 010450  005201                      RTI1:   INC     R1                ;RTI SHOULD NOT ALLOW THIS
 010452  012737  000220  000402              MOV     #220,@#$FATAL     ;MOVE TO MAILBOX #  *******  220  *******
 010460  005212                              INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 010462  000000                              HALT                      ;T- BIT DID NOT CAUSE TRAP
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 756
 010464  005701                      RTI2:   TST     R1
                                                                       ;RTI SHOULD NOT ALLOW 1 INST. BEFORE TRAP
 010466  001405                              BEQ     TST60
 010470  012737  000221  000402              MOV     #221,@#$FATAL     ;MOVE TO MAILBOX #  *******  221  *******
 010476  005212                              INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 010500  000000                              HALT                      ;RTI DID ALLOW 1 INST. BEFORE TRAP,OR WRONG $TESTN
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 747
```

```
1195
1196                                             ;******************************************************************
 (2)                                             ;TEST 60         TEST  TRAP ON TRAP
 (3)                                             ;******************************************************************
 (2)  010502  005237  000404                     TST60:  INC     @#$TESTN          ;UPDATE TEST NUMBER
 (2)  010506  022737  000060  000404                     CMP     #60,@#$TESTN      ;SEQUENCE ERROR?
 (2)  010514  001033                                     BNE     TRACE             ;BR TO ERROR HALT ON SEQ ERROR
1197                                             ;TEST THAT TRACE BIT TRAPS ARE INHIBITED ON TRAP INST
1198
1199  010516  012705  177777                             MOV     #177777,%5
1200  010522  012706  000500                     TRPTRP: MOV     #BUFF,%6
1201  010526  012767  010600  167260                     MOV     #TRACE1,14        ;TRACE TRAP
1202  010534  005027  000016                             CLR     #16               ;
1203  010540  005027  000022                             CLR     #22
1204  010544  012767  010616  167246                     MOV     #TONT1,20         ;IOT TRAP
1205  010552  012746  000020                             MOV     #20,-(SP)         ;PUSH T BIT
1206  010556  012746  010564                             MOV     #.+6,-(SP)        ;PUSH PC
1207  010562  000006                                     RTT                       ;SET T BIT
1208  010564  000004                                     IOT                       ;TRAP, NEW STATUS HAVE TRACE RESET
1209  010566  012737  000222  000402                     MOV     #222,@#$FATAL     ;MOVE TO MAILBOX #  *******  222  *******
 (2)  010574  005212                                     INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (2)  010576  000000                                     HALT                      ;NO TRAP OCCURRED
 (4)                                                                               ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                               ; AND REPLACE NEXT INST W/ 746
1210  010600  005205                             TRACE1: INC     %5        ;IF FAILED TRY THIS TEST TWICE BUT NO MORE
1211  010602  001747                                     BEQ     TRPTRP
 (1)  010604                                     TRACE:
 (3)  010604  012737  000223  000402                     MOV     #223,@#$FATAL     ;MOVE TO MAILBOX #  *******  223  *******
 (2)  010612  005212                                     INC     (R2)              ;SET MSGTYP TO FATAL ERROR
 (2)  010614  000000                                     HALT                      ;IOT SHOULD HAVE CLEARED THE T BIT,OR WRONG $TESTN
 (4)                                                                               ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                               ; AND REPLACE NEXT INST W/ 737
1212  010616  012767  000016  167170             TONT1:  MOV     #16,14
1213  010624  012767  000022  167166                     MOV     #22,20
```

```
 1215
 1216                                          ;*********************************************************************
  (2)                                          ;TEST 61          TEST  THAT THE TRACE BIT WILL CAUSE A TRAP
  (3)                                          ;*********************************************************************
  (2) 010632  005237  000404          TST61:  INC     @#$TESTN          ;UPDATE TEST NUMBER
  (2) 010636  022737  000061  000404          CMP     #61,@#$TESTN      ;SEQUENCE ERROR?
  (2) 010644  001026                          BNE     TST62-12          ;BR TO ERROR HALT ON SEQ ERROR
 1217 010646  012706  000500                  MOV     #BUFF,%6          ;SET UP STACK POINTER
 1218 010652  012767  010712  167134          MOV     #TRC1,14          ;TRACE TRAP RETURN
 1219 010660  005067  167132                  CLR     16
 1220 010664  012746  000020                  MOV     #20,-(SP)         ;PUSH T BIT
 1221 010670  012746  010676                  MOV     #.+6,-(SP)        ;PUSH PC
 1222 010674  000002                          RTI                       ;SET T BIT
 1223 010676  000240                          NOP
 1224 010700  012737  000224  000402          MOV     #224,@#$FATAL     ;MOVE TO MAILBOX #  *******  224  *******
  (2) 010706  005212                          INC     (R2)              ;SET MSGTYP TO FATAL ERROR
  (2) 010710  000000                          HALT                      ;DO NOT TRAP
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 755
 1225 010712  036727  167560  000020  TRC1:   BIT     BUFF-2,#20        ;CHECK FOR T BIT ON STACK
 1226 010720  001005                          BNE     TST62
  (4) 010722  012737  000225  000402          MOV     #225,@#$FATAL     ;MOVE TO MAILBOX #  *******  225  *******
  (3) 010730  005212                          INC     (R2)              ;SET MSGTYP TO FATAL ERROR
  (3) 010732  000000                          HALT                      ;T BIT NOT SAVED ON STACKED,OR WRONG $TESTN
  (5)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (5)                                                                   ; AND REPLACE NEXT INST W/ 744
 1227                                          ;*********************************************************************
  (2)                                          ;TEST 62          TEST  THAT AN RTI POPS THE T BIT
  (3)                                          ;*********************************************************************
  (2) 010734  005237  000404          TST62:  INC     @#$TESTN          ;UPDATE TEST NUMBER
  (2) 010740  022737  000062  000404          CMP     #62,@#$TESTN      ;SEQUENCE ERROR?
  (2) 010746  001020                          BNE     TST63-12          ;BR TO ERROR HALT ON SEQ ERROR
 1228 010750  012706  000500                  MOV     #BUFF,%6          ;SET UP THE STACK
 1229 010754  012746  000020                  MOV     #20,-(6)          ;FUTURE T BIT ON STACK
 1230 010760  012746  010774                  MOV     #TRC2,-(6)        ;RTI RETURN
 1231 010764  012767  011010  167022          MOV     #TRC3,14          ;TRACE TRAP INTERRUPT POINTER
 1232 010772  000002                          RTI
 1233
 1234 010774  000240                  TRC2:   NOP                       ;TRACE IS SET SHOULD TRAP TO 14
 1235 010776  012737  000226  000402          MOV     #226,@#$FATAL     ;MOVE TO MAILBOX #  *******  226  *******
  (2) 011004  005212                          INC     (R2)              ;SET MSGTYP TO FATAL ERROR
  (2) 011006  000000                          HALT                      ;DID NOT TRACE TRAP,OR WRONG $TESTN
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 757
 1236
 1237 011010  012767  000016  166776  TRC3:   MOV     #16,14
 1238 011016  005067  166774                  CLR     16
```

```
1240
1241                                            ;********************** *************************************************************
 (2)                                            ;TEST 63        TEST  THAT A PENDING INTERRUPT OCCURS BEFORE TRAP
 (3)                                            ;*******************************************************************************************
 (2)  011022  005237  000404                    TST63:  INC     @#$TESTN         ;UPDATE TEST NUMBER
 (2)  011026  022737  000063  000404                    CMP     #63,@#$TESTN     ;SEQUENCE ERROR?
 (2)  011034  001052                                    BNE     TR1              ;BR TO ERROR HALT ON SEQ ERROR
1242  011036  032767  000001  167354                    BIT     #1,$ENV          ; CHECK IF ON APT
1243  011044  001403                                    BEQ     NOAPT            ; IF NOT ON APT
1244  011046  005767  167334                            TST     $PASS            ; CHECK IF ON FIRST PASS
1245  011052  001052                                    BNE     TST64            ; IF NOT FIRST PASS
1246  011054                                    NOAPT:
1247  011054  105737  177564                            TSTB    @#TPS
1248  011060  100375                                    BPL     .-4
1249  011062  012706  000500                            MOV     #BUFF,%6
1250  011066  012767  000340  002022                    MOV     #340,STATUS      ;HIGHEST PRIORITY LEVEL
1251  011074  106437                                    .WORD   106437
 (1)  011076  013116                                    .WORD   STATUS
1252  011100  012767  011150  166756                    MOV     #TR0,64
1253  011106  012767  000100  166450                    MOV     #100,TTCSR       ;INTERRUPT FOR TTY PUNCH/PRINTER
1254  011114  012767  011162  166712                    MOV     #TR1,34          ;TRAP VECTOR
1255  011122  012767  011174  166734                    MOV     #TR2,64          ;TTY VECTOR
1256  011130  012767  000340  166700                    MOV     #340,36          ;IF TRAP TRAPS, MOVE 340 TO PRIORITY
1257  011136  005067  001754                            CLR     STATUS           ;SHOULD TRAP AT END OF CLR INST
1258  011142  106437                                    .WORD   106437
 (1)  011144  013116                                    .WORD   STATUS
1259  011146  104400                                    TRAP                     ;TTY INTERRUPT SHOULD OVERRIDE TRAP
1260  011150                                    TR0:
 (3)  011150  012737  000227  000402                    MOV     #227,@#$FATAL    ;MOVE TO MAILBOX #  *******  227  *******
 (2)  011156  005212                                    INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (2)  011160  000000                                    HALT                     ;TTY SHOULDN'T HAVE INTERRUPTED
 (4)                                                                             ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                             ; AND REPLACE NEXT INST W/ 725
1261  011162                                    TR1:
 (3)  011162  012737  000230  000402                    MOV     #230,@#$FATAL    ;MOVE TO MAILBOX #  *******  230  *******
 (2)  011170  005212                                    INC     (R2)             ;SET MSGTYP TO FATAL ERROR
 (2)  011172  000000                                    HALT                     ;INTERRUPT DID NOT OCCUR FIRST,OR WRONG $TESTN
 (4)                                                                             ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                             ; AND REPLACE NEXT INST W/ 720
1262  011174  005067  166636                    TR2:    CLR     36
```

```
1264
1265                                          ;************************ *********************************************************
 (2)                                          ;TEST 64        TEST  THAT A PENDING INTERRUPT;INTERRUPTS BETWEEN TRAPS
 (3)                                          ;*********************************************************************************
 (2)  011200  005237  000404                  TST64:  INC     @#$TESTN           ;UPDATE TEST NUMBER
 (2)  011204  022737  000064  000404                  CMP     #64,@#$TESTN       ;SEQUENCE ERROR?
 (2)  011212  001042                                  BNE     TR5                ;BR TO ERROR HALT ON SEQ ERROR
1266  011214  032767  000001  167176                  BIT     #1,$ENV            ;CHECK IF ON APT
1267  011222  001403                                  BEQ     NOAPT1             ; IF NOT
1268  011224  005767  167156                          TST     $PASS              ; CHECK IF ON FIRST PASS
1269  011230  001055                                  BNE     TST65              ; IF NOT
1270  011232                                  NOAPT1:
1271  011232  042767  000100  166324                  BIC     #100,TTCSR
1272  011240  012706  000500                          MOV     #BUFF,%6
1273  011244  012767  000340  001644                  MOV     #340,STATUS
1274  011252  106437                                  .WORD   106437
 (1)  011254  013116                                  .WORD   STATUS
1275  011256  012767  000100  166300                  MOV     #100,TTCSR
1276  011264  012767  011316  166542                  MOV     #TR3,34            ;TRAP
1277  011272  012767  011332  166564                  MOV     #TR4,64            ;TTY OUTPUT
1278  011300  012767  011320  166512                  MOV     #TR5,20            ;IOT
1279  011306  012767  000340  166506                  MOV     #340,22            ;IOT PRIORITY
1280  011314  104400                                  TRAP                       ;THE ACT OF TRAPPING LOWER PRIORITY
1281  011316  000004                          TR3:    IOT                        ;INTERRUPT SHOULD OCCUR IN PLACE OF IOT TRAP
1282  011320                                  TR5:
 (3)  011320  012737  000231  000402                  MOV     #231,@#$FATAL      ;MOVE TO MAILBOX #  *******  231  *******
 (2)  011326  005212                                  INC     (R2)               ;SET MSGTYP TO FATAL ERROR
 (2)  011330  000000                                  HALT                       ;NO INTERRUPT BETWEEN TRAPS,OR WRONG $TESTN
 (4)                                                                             ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                                             ; AND REPLACE NEXT INST W/ 730
1283  011332  005067  166464                  TR4:    CLR     22                 ;CLR IOT PRIORITY
1284  011336  005067  166524                          CLR     66
1285  011342  012767  000066  166514                  MOV     #66,64
1286  011350  012767  000036  166456                  MOV     #36,34
1287  011356  012767  000022  166434                  MOV     #22,20
1288
```

```
  1290
  1291                                         ;*******************************************************************************
   (2)                                         ;TEST 65         TEST  THAT "RESET" GOES TO OUTSIDE WORLD
   (3)                                         ;*******************************************************************************
   (2)  011364  005237  000404                 TST65:  INC     @#$TESTN          ;UPDATE TEST NUMBER
   (2)  011370  022737  000065  000404                 CMP     #65,@#$TESTN      ;SEQUENCE ERROR?
   (2)  011376  001026                                 BNE     TST66-12          ;BR TO ERROR HALT ON SEQ ERROR
  1292  011400  106437                                 .WORD   106437
   (1)  011402  013122                                 .WORD   K340
  1293  011404  012767  000100  166152                 MOV     #100,TTCSR        ;SET INTERRUPT ENABLE
  1294  011412  012767  000100  166140                 MOV     #100,TRCSR        ;SET INTERRUPT ENABLE
  1295  011420  000005                                 RESET                     ;SHOULD CLEAR INTERRUPT ENABLE
  1296  011422  032767  000100  166134                 BIT     #100,TTCSR        ;TEST FOR CLEAR
  1297  011430  001405                                 BEQ     1$
   (3)  011432  012737  000232  000402                 MOV     #232,@#$FATAL     ;MOVE TO MAILBOX #  *******  232  *******
   (2)  011440  005212                                 INC     (R2)              ;SET MSGTYP TO FATAL ERROR
   (2)  011442  000000                                 HALT                      ;RESET FAILED TO CLEAR TTCSR
   (4)                                                                           ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                           ; AND REPLACE NEXT INST W/ 755
  1298  011444  032767  000100  166106  1$:    BIT     #100,TRCSR        ;TEST FOR CLEAR
  1299  011452  001405                                 BEQ     TST66
   (4)  011454  012737  000233  000402                 MOV     #233,@#$FATAL     ;MOVE TO MAILBOX #  *******  233  *******
   (3)  011462  005212                                 INC     (R2)              ;SET MSGTYP TO FATAL ERROR
   (3)  011464  000000                                 HALT                      ;RESET FAILED TO CLEAR TRCSR,OR WRONG $TESTN
   (5)                                                                           ; TO SCOPE REPLACE HALT W/ 240
   (5)                                                                           ; AND REPLACE NEXT INST W/ 744
```

```
 1301
 1302                                         ;********************* *****************************************************
  (2)                                         ;TEST 66          TEST  THAT RESET HAS NO EFFECT ON THE TRACE TRAP
  (3)                                         ;*****************************************************************************
  (2)  011466  005237  000404                 TST66:  INC     @#$TESTN         ;UPDATE TEST NUMBER
  (2)  011472  022737  000066  000404                 CMP     #66,@#$TESTN     ;SEQUENCE ERROR?
  (2)  011500  001014                                 BNE     RSTP3            ;BR TO ERROR HALT ON SEQ ERROR
 1303  011502  012706  000500                         MOV     #BUFF,%6         ;SET STACK
 1304  011506  012767  011544  166300                 MOV     #RESET2,14       ;SET UP TRACE VECTOR
 1305  011514  012746  000020                         MOV     #20,-(SP)        ;PUSH T BIT
 1306  011520  012746  011526                         MOV     #.+6,-(SP)       ;PUSH PC
 1307  011524  000006                                 RTT                      ;SET T BIT
 1308  011526  000005                                 RESET                    ;SHOULD HAVE NO EFFECT
 1309  011530  000005                                 RESET                    ;NO EFFECT
 1310  011532                                 RSTP3:
  (3)  011532  012737  000234  000402                 MOV     #234,@#$FATAL    ;MOVE TO MAILBOX #  *******  234  *******
  (2)  011540  005212                                 INC     (R2)             ;SET MSGTYP TO FATAL ERROR
  (2)  011542  000000                                 HALT                     ;TRACE TRAP FAILED,OR WRONG $TESTN
  (4)                                                                          ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                          ; AND REPLACE NEXT INST W/ 756
 1311  011544  005067  001346                 RESET2: CLR     STATUS           ;CLEAR TRACK
 1312  011550  106437                                 .WORD   106437
  (1)  011552  013116                                 .WORD   STATUS
 1313  011554  012767  000016  166232                 MOV     #16,14
 1314  011562  005067  166230                         CLR     16               ;TRACE STATUS
```

```
 1316
 1317                                   ;********************************************************************************
  (2)                                   ;TEST 67        TEST  THAT WHEN TTY INTERRUPTS IT POPS NEW STATUS
  (3)                                   ;********************************************************************************
  (2) 011566  005237  000404            TST67:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2) 011572  022737  000067  000404              CMP     #67,@#$TESTN    ;SEQUENCE ERROR?
  (2) 011600  001070                              BNE     RSTP4           ;BR TO ERROR HALT ON SEQ ERROR
 1318 011602  032767  000001  166610              BIT     #1,$ENV         ; CHECK IF ON APT
 1319 011610  001403                              BEQ     NOAPT2          ; IF NOT ON APT
 1320 011612  005767  166570                      TST     $PASS           ;CHECK IF FIRST PASS
 1321 011616  001073                              BNE     TST70           ; IF NOT
 1322 011620                            NOAPT2:
 1323 011620  000005                              RESET
 1324 011622  012706  000500                      MOV     #BUFF,%6        ;SET UP STACK
 1325 011626  012767  011670  166230              MOV     #TTY3,64        ;INTERRUPT VECTOR
 1326 011634  106437                              .WORD   106437
  (1) 011636  013120                              .WORD   K0
 1327 011640  012767  000357  166220              MOV     #357,66         ;HIGH PRIORITY ON INTERRUPT
 1328 011646  052767  000100  165710              BIS     #100,TTCSR      ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
 1329 011654  000240                              NOP
 1330 011656  012737  000235  000402              MOV     #235,@#$FATAL   ;MOVE TO MAILBOX #  *******  235  *******
  (2) 011664  005212                              INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 011666  000000                              HALT                    ;NO INTERRUPT
  (4)                                                                     ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                     ; AND REPLACE NEXT INST W/ 744
 1331 011670                            TTY3:
  (1) 011670  106737                              .WORD   106737
  (1) 011672  013116                              .WORD   STATUS
 1332 011674  022767  000357  001214              CMP     #357,STATUS
 1333 011702  001405                              BEQ     1$
  (3) 011704  012737  000236  000402              MOV     #236,@#$FATAL   ;MOVE TO MAILBOX #  *******  236  *******
  (2) 011712  005212                              INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 011714  000000                              HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS
  (4)                                                                     ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                     ; AND REPLACE NEXT INST W/ 731
 1334 011716  000005                    1$:     RESET                   ;CLR NTERRUPT ENABLE
 1335 011720  012706  000500                      MOV     #BUFF,%6        ;STACK SET UP
 1336 011724  012767  011750  166132              MOV     #TTY4,64        ;INTERRUPT VECTOR
 1337 011732  005067  166130                      CLR     66              ;CLR NEW STATUS
 1338 011736  106437                              .WORD   106437
  (1) 011740  013120                              .WORD   K0
 1339 011742  052767  000100  165614              BIS     #100,TTCSR      ;SET INTERRUPT ENABLE
 1340 011750                            TTY4:
  (1) 011750  106737                              .WORD   106737
  (1) 011752  013116                              .WORD   STATUS
 1341 011754  005767  001136                      TST     STATUS
 1342 011760  001405                              BEQ     RST4
  (1) 011762                            RSTP4:
  (3) 011762  012737  000237  000402              MOV     #237,@#$FATAL   ;MOVE TO MAILBOX #  *******  237  *******
  (2) 011770  005212                              INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2) 011772  000000                              HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS,OR WRONG $TESTN
  (4)                                                                     ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                     ; AND REPLACE NEXT INST W/ 702
 1343 011774  005067  165564            RST4:   CLR     TTCSR
```

```
 1344  012000  012767  000066  166056          MOV     #66,64
```

```
 1346
 1347
 1348                                   ;THIS ROUTINE TESTS THAT NO LEGAL ADDRESS TRAPS.
 1349                                   ;AND THAT AN ILLEGAL ADDRESS TRAPS TO LOCATION 4
 1350                                   ;*****************************************************************************
  (2)                                   ;TEST 70        TEST  NON-EXISTENT ADDRESS TRAPS
  (3)                                   ;*****************************************************************************
  (2) 012006  005237  000404            TST70:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2) 012012  022737  000070  000404             CMP     #70,@#$TESTN    ;SEQUENCE ERROR?
  (2) 012020  001066                             BNE     AUTO1           ;BR TO ERROR HALT ON SEQ ERROR
 1351
 1352                                   ;THIS ROUTINE TESTS MEMORY UNTIL IT DOES A NXM STOP
 1353  012022  000402                           BR      ADALL
 1354  012024  000000                   TSL:    0
 1355  012026  000000                   CORH:   0
 1356  012030  005000                   ADALL:  CLR     %0
 1357  012032  005067  165750                   CLR     6
 1358  012036  012767  012072  165740           MOV     #ATRAP,4        ;SET UP ADDRESS TRAP ENTRANCE
 1359  012044  012706  000500           NOR:    MOV     #BUFF,SP
 1360  012050  105720                           TSTB    (0)+            ;IF OUTSIDE OF CORE, TRAP TO 4
 1361  012052  020027  170000                   CMP     %0,#170000              ;IS POINTER IN SIDE CORE
 1362  012056  101772                           BLOS    NOR             ;TEST THE REST OF CORE
 1363  012060                           AUTO:
  (3)  012060  012737  000240  000402           MOV     #240,@#$FATAL   ;MOVE TO MAILBOX #  *******  240  *******
  (2)  012066  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  012070  000000                           HALT                    ;SHOULD HAVE TRAPED
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 753
 1364                                   ;RETURN HERE ON AN ADDRESS TRAP
 1365  012072  005300                   ATRAP:  DEC     R0
 1366  012074  010067  177726                   MOV     R0,CORH         ;MOVE THE FIRST NXM LOCATION IN CORH
 1367                                   ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTANT MEMORY LOCATION
 1368  012100  012700  170001                   MOV     #170001,R0      ;SET UP THE HIGHEST MEM LOCATION
 1369  012104  012767  012142  165672   CTRAP:  MOV     #BTRAP,4        ;SET UP THE VECTOR
 1370  012112  012706  000500                   MOV     #BUFF,SP
 1371  012116  105740                           TSTB    -(R0)           ;DOES IT EXIST?
 1372  012120  005200                   DTRAP:  INC     R0              ;IF YES INCREMENT IT
 1373  012122  020067  177700                   CMP     R0,CORH         ;IS IT THE SAME LOCATION?
 1374  012126  001430                           BEQ     TRAPB
  (3)  012130  012737  000241  000402           MOV     #241,@#$FATAL   ;MOVE TO MAILBOX #  *******  241  ***  ***
  (2)  012136  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  012140  000000                           HALT                    ;CONTENTS OF R0 AND CORH SHOULD HAVE BEEN EQUAL
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 727
 1375                                                                   ;IF THIS COMPARISON FAILS IT MEANS
 1376                                                                   ;THAT SOME LEGAL ADDRESS TRAPPEDOR
 1377                                                                   ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
 1378  012142                           BTRAP:
  (1)  012142  106737                           .WORD   106737
  (1)  012144  013116                           .WORD   STATUS
 1379  012146  005767  000744                   TST     STATUS
 1380  012152  001405                           BEQ     1$
  (3)  012154  012737  000242  000402           MOV     #242,@#$FATAL   ;MOVE TO MAILBOX #  *******  242  *******
  (2)  012162  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
```

```
   (2)  012164  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
   (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                  ; AND REPLACE NEXT INST W/ 715
 1381  012166  026727  166302  012120  1$:     CMP     BUFF-4,#DTRAP
 1382  012174  001743                        BEQ     CTRAP
   (1)  012176                          AUTO1:
   (3)  012176  012737  000243  000402        MOV     #243,@#$FATAL   ;MOVE TO MAILBOX #  *******  243  *******
   (2)  012204  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
   (2)  012206  000000                        HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
   (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
   (4)                                                                  ; AND REPLACE NEXT INST W/ 704
 1383  012210  012767  000006  165566  TRAPB:  MOV     #6,4
 1384  012216  005067  165564                  CLR     6
```

```
1386
1387                                    ;*********************************************************************
 (2)                                    ;TEST 71        TEST THE 'WAIT' INSTRUCTION
 (3)                                    ;*********************************************************************
 (2) 012222 005237 000404       TST71:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 (2) 012226 022737 000071 000404        CMP     #71,@#$TESTN    ;SEQUENCE ERROR?
 (2) 012234 001070                      BNE     REES1           ;BR TO ERROR HALT ON SEQ ERROR
1388 012236 032767 000001 166154        BIT     #1,$ENV ;CHECK IF ON APT
1389 012244 001403                      BEQ     NOAPT3          ;BR, IF NOT ON APT
1390 012246 005767 166134               TST     $PASS           ;CHECK IF FIRST PASS
1391 012252 001066                      BNE     REES            ;BR, IF NOT
1392 012254 042767 000100 165302 NOAPT3: BIC    #100,TPS        ;CLEAR INTERRUPT ENABLE
1393 012262 012706 000500               MOV     #BUFF,SP        ;SET UP THE STACK
1394 012266 012767 012362 165570        MOV     #WATE,64        ;SET UP THE INTERRUPT VECTOR
1395 012274 005067 165566               CLR     66
1396 012300 105767 165260       WATE1:  TSTB    TPS             ;WAIT FOR READY
1397 012304 100375                      BPL     WATE1           ;TO BE UP
1398 012306 012767 000015 165252        MOV     #15,TPB         ;DO A CARRIAGE RETURN
1399 012314 105767 165244       WATE2:  TSTB    TPS             ;WAIT FOR READY TO COME UP
1400 012320 100375                      BPL     WATE2
1401 012322 012767 000015 165236        MOV     #15,TPB         ;DO ANOTHER CARRIAGE RETURN
1402 012330 052767 000100 165226        BIS     #100,TPS        ;SET THE INTERRUPT ENABLE
1403 012336 005067 000554               CLR     STATUS          ;CLEAR THE PSW
1404 012342 106437                      .WORD   106437
 (1) 012344 013116                      .WORD   STATUS
1405 012346 000001              WATE3:  WAIT                    ;WAIT FOR THE INTERRUPT
1406 012350 012737 000244 000402        MOV     #244,@#$FATAL   ;MOVE TO MAILBOX #  *******  244  *******
 (2) 012356 005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (2) 012360 000000                      HALT                    ;WAIT INSTRUCTION DID NOT LOOP
 (4)                                                            ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                            ; AND REPLACE NEXT INST W/ 725
1407 012362                     WATE:
 (1) 012362 106737                      .WORD   106737
 (1) 012364 013116                      .WORD   STATUS
1408 012366 005767 000524               TST     STATUS          ;IS THE PSW CORRECT?
1409 012372 001405                      BEQ     1$
 (3) 012374 012737 000245 000402        MOV     #245,@#$FATAL   ;MOVE TO MAILBOX #  *******  245  *******
 (2) 012402 005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (2) 012404 000000                      HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
 (4)                                                            ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                            ; AND REPLACE NEXT INST W/ 713
1410 012406 026727 166062 012350 1$:    CMP     BUFF-4,#WATE3+2 ;IS THE OLD PC SAVED
1411 012414 001405                      BEQ     REES
 (1) 012416                     REES1:
 (3) 012416 012737 000246 000402        MOV     #246,@#$FATAL   ;MOVE TO MAILBOX #  *******  246  *******
 (2) 012424 005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 (2) 012426 000000                      HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
 (4)                                                            ; TO SCOPE REPLACE HALT W/ 240
 (4)                                                            ; AND REPLACE NEXT INST W/ 702
1412 012430 042767 000100 165126 REES:  BIC     #100,TPS        ;CLEAR THE INTERRUPT ENABLE
1413 012436 012767 000066 165420        MOV     #66,64
```

```
 1415
 1416                                   ;*********************************************************************
  (2)                                   ;TEST 72        TEST  ,THAT ODD ADDRESSING WILL IGNORE BIT 0
  (3)                                   ;*********************************************************************
  (2)  012444  005237  000404           TST72:  INC     @#$TESTN        ;UPDATE TEST NUMBER
  (2)  012450  022737  000072  000404           CMP     #72,@#$TESTN    ;SEQUENCE ERROR?
  (2)  012456  001002                           BNE     RSTP5           ;BR TO ERROR HALT ON SEQ ERROR
 1417  012460  000167  000013                   JMP     ODD+1
 1418  012464                         RSTP5:
  (3)  012464  012737  000247  000402           MOV     #247,@#$FATAL   ;MOVE TO MAILBOX #  *******  247  *******
  (2)  012472  005212                           INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  012474  000000                           HALT                    ;SHOULD HAVE JUMPED,OR WRONG $TESTN
  (4)                                                                   ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                   ; AND REPLACE NEXT INST W/ 770
 1419  012476  005307                 ODD:    DEC     PC
```

```

                                     ;*********************** ***************************************************
                                     ;TEST 73         TEST  THAT ALL RESERVED INSTRUCTIONS TRAP
                                     ;***************************************************************************
012500  005237  000404               TST73:  INC     @#$TESTN          ;UPDATE TEST NUMBER
012504  022737  000073  000404               CMP     #73,@#$TESTN      ;SEQUENCE ERROR?
012512  001136                               BNE     RET4              ;BR TO ERROR HALT ON SEQ ERROR
012514  010267  000540                       MOV     R2,R2STOR         ; SAVE REG 2
012520  010700                               MOV     PC,%0             ;SET THESE
012522  010704                               MOV     PC,%4             ;REGISTERS
012524  010705                               MOV     PC,%5             ;TO EXISTENT MEMORY LOCATIONS
012526  012703  013042                       MOV     #TABLE,TAB        ;TABLE POINTER
012532  012302                       GIN1:   MOV     (TAB)+,FIRST      ;FIRST OR CURRENT INSTRUCTION
012534  012301                               MOV     (TAB)+,LAST       ;LAST INSTRUCTION OR GROUP
012536  020267  000310                       CMP     FIRST,EISFIS      ;IS IT THE 'EISFIS' GROUP?
012542  001014                               BNE     2$                ;NO
012544  032767  000300  165654               BIT     #300,$CPUOP       ;DO WE HAVE EISFIS OPTION?
012552  001403                               BEQ     1$                ;NO
012554  062703  000004                       ADD     #4,TAB            ;IF YES DO NO DO THE
012560  000764                               BR      GIN1              ;EIS FIS OP CODES
012562  032767  000004  165632       1$:     BIT     #4,$SWREG         ;DO WE HAVE DIS INSTRUCTION SET
012570  001401                               BEQ     2$                ;NO
012572  000757                               BR      GIN1              ;IF YES, DO NOT DO EIS OP CODES - DO JUST FIS
012574  020267  000262               2$:     CMP     FIRST,STOP        ;IS IT THE STOP GROUP
012600  001007                               BNE     3$                ;NO
012602  032767  000020  165612               BIT     #20,$SWREG        ;DO WE WANT TO DO IT?
012610  001403                               BEQ     3$                ;YES
012612  062703  000010                       ADD     #10,TAB           ;SKIP ENTIRE STOP GROUP
012616  000745                               BR      GIN1              ;NO
012620  020267  000242               3$:     CMP     FIRST,DIS         ;IS THIS THE DIS GROUP?
012624  001005                               BNE     4$                ;NO
012626  032767  000004  165566               BIT     #4,$SWREG         ;DO WE HAVE DIS OPTION?
012634  001401                               BEQ     4$                ;NO
012636  000735                               BR      GIN1              ;IF YES, SKIP THE DIS GROUP
012640  020267  000232               4$:     CMP     FIRST,STOP1       ;IS IT THE STOP1 GROUP?
012644  001005                               BNE     5$                ;NO
012646  032767  000010  165546               BIT     #10,$SWREG        ;DO WE WANT TO DO IT?
012654  001401                               BEQ     5$                ;YES
012656  000725                               BR      GIN1              ,NO
012660  020267  000216               5$:     CMP     FIRST,FINISH      ;TESTED ALL
012664  001002                               BNE     6$                ;NO, BRANCH
012666  000167  000250                       JMP     GIN3              ;YES, GO TO END OF PASS ROUTINE
012672  010267  000206               6$:     MOV     FIRST,INST        ;SET UP INST
012676  005267  000202               GIN2:   INC     INST
012702  012767  012730  165100               MOV     #RET,10           ;SET UP RETURN FROM TRAP
012710  012706  000500                       MOV     #BUFF,SP          ;SET UP STACK POINTER
012714  005067  000176                       CLR     STATUS            ;CLEAR PRIORITY
012720  106437                               .WORD   106437
012722  013116                               .WORD   STATUS
012724  000167  000154                       JMP     INST              ;EXECUTE RESERVED INSTRUCTION

                                     ;TRAPPING SHOULD SEND YOU HERE
012730  010267  000104               RET:    MOV     R2,R2SAVE         ; SAVE REG 2
012734  016702  000320                       MOV     R2STOR,R2         ; RESTORE MAILBOX POINTER
```

```
 1469  012740  020627  000474                  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
 1470  012744  001405                          BEQ     RET1
  (3)  012746  012737  000250  000402          MOV     #250,@#$FATAL   ;MOVE TO MAILBOX #  *******  250  *******
  (2)  012754  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  012756  000000                          HALT                    ;WRONG DECREMENT
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 655
 1471  012760  026727  165510  013106  RET1:   CMP     BUFF-4,#INST+2  ;LOC OF INST UNINCREMENTED
 1472  012766  001405                          BEQ     RET2
  (3)  012770  012737  000251  000402          MOV     #251,@#$FATAL   ;MOVE TO MAILBOX #  *******  251  *******
  (2)  012776  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  013000  000000                          HALT                    ;INST INC ON TRAP
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 644
 1473  013002  005767  165470          RET2:   TST     BUFF-2
 1474  013006  001405                          BEQ     RET3
  (1)  013010                          RET4:
  (3)  013010  012737  000252  000402          MOV     #252,@#$FATAL   ;MOVE TO MAILBOX #  *******  252  *******
  (2)  013016  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
  (2)  013020  000000                          HALT                    ;CONDITION CODES SET ON TRAP,OR WRONG $TESTN
  (4)                                                                  ; TO SCOPE REPLACE HALT W/ 240
  (4)                                                                  ; AND REPLACE NEXT INST W/ 634
 1475  013022  016702  000012          RET3:   MOV     R2SAVE,R2       ; RESTORE REG 2
 1476  013026  026701  000052                  CMP     INST,LAST
 1477  013032  001637                          BEQ     GIN1            ;SET UP NEW GROUP
 1478  013034  000167  177636                  JMP     GIN2            ;FINISH OLD GROUP
 1479  013040  000000                  R2SAVE: .WORD   0
 1480                                                                   .END OF INSTRUCTION GROUP
 1481  013042  006777                  TABLE:  6777
 1482  013044  007777                          7777
 1483  013046  106777                          106777
 1484  013050  107777                          107777
 1485  013052  067777                  EISFIS: 67777   ;IF WE HAVE THE EIS FIS OPTION
 1486  013054  073777                          73777   ;THEN THE EISFIS GROUP
 1487  013056  074777                  FIS:    74777   ;WILL BE SKIPED
 1488  013060  075037                          75037
 1489  013062  075377                  STOP:   75377
 1490  013064  076026                          76026
 1491  013066  076027                  DIS:    76027
 1492  013070  076057                          76057
 1493  013072  076057                          76057
 1494  013074  076777                          76777
 1495  013076  167777                  STOP1:  167777
 1496  013100  177777                          177777
 1497  013102  013102                  FINISH: .                       ;END FLAG
 1498  013104  000000                  INST:   HALT                    ;WILL CONTINUE RESERVED INST
 1499  013106  000406                          BR      TERR
 1500  013110  000405                          BR      TERR
 1501  013112  000404                          BR      TERR
 1502  013114  000403                          BR      TERR
 1503  013116  000000                  STATUS: 0
 1504  013120  000000                  K0:     0
 1505  013122  000340                  K340:   340
 1506  013124  016702  000130          TERR:   MOV     R2STOR,R2       ; RESTORE R2
```

```
 1507  013130  012737  000255  000402          MOV     #255,@#$FATAL   ; INDICATE ERROR
 1508  013136  005212                          INC     (R2)
 1509  013140  000000                          HALT            ;INSTRUCTION TRAP IN ERROR
 1510
 1511
 1512  013142  005237  000406          GIN3:   INC     @#$PASS
 1513  013146  105267  000110                  INCB    PASSPT          ;SHOULD PRINT THIS PASS?
 1514  013152  001023                          BNE     ACT             ;NO
 1515  013154  132767  000040  165237        BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
 1516  013162  001017                          BNE     ACT             ;NO
 1517  013164  012700  013264                MOV     #MSG,R0         ;GET MSG ADDR.
 1518  013170  105737  177564          WAIT:   TSTB    @#TPS           ;TTY READY
 1519  013174  100375                          BPL     WAIT            ;NO WAIT
 1520  013176  112037  177566                MOVB    (R0)+,@#TPB     ;PRINT CHARACTER
 1521  013202  001372                          BNE     WAIT            ;NEXT IF NOT DONE.
 1522  013204  105737  177564          WAIT1:  TSTB    @#TPS
 1523  013210  100375                          BPL     WAIT1
 1524  013212  000005                          RESET
 1525  013214  012767  177761  000040        MOV     #177761,PASSPT  ;DO IT 15 DECIMAL TIMES
 1526  013222  013700  000042          ACT:    MOV     @#42,R0         ;CHECK ACT
 1527  013226  001405                          BEQ     GOAGIN          ;KEEP GOING
 1528  013230  000005                          RESET
 1529  013232  004710                  $ENDAD: JSR     PC,(R0)         ;ACT HOOKS
 1530  013234  000240                          NOP
 1531  013236  000240                          NOP
 1532  013240  000240                          NOP
 1533  013242  012767  000012  164540  GOAGIN: MOV     #12,10
 1534  013250  005067  164536                  CLR     12
 1535  013254  000167  165320                  JMP     RESTRT          ;DO NEXT PASS
 1536  013260  000000                  R2STOR: .WORD   0
 1537  013262  177777                  PASSPT: -1
 1538  013264  005015  047105  020104  MSG:    .ASCIZ  <15><12>.END OF PASS.
       013272  043117  050040  051501
       013300  000123
```

```
1540
1541
1542                                    ;**********************************
1543                                    ;POWER FAIL ROUTINE
1544                                    ;**********************************
1545
1546  013302  012767  013312  164514  PWRDWN: MOV     #PWRUP,24
1547  013310  000000                          HALT
1548
1549  013312  012767  013302  164504  PWRUP:  MOV     #PWRDWN,24
1550  013320  012706  000500                  MOV     #BUFF,SP
1551  013324  132767  000040  165067          BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
1552  013332  001013                          BNE     PFRES           ;NO
1553  013334  012700  013366                  MOV     #MSGPWF,R0      ;GET MSG ADDR.
1554  013340  105737  177564          PWAIT:  TSTB    @#TPS           ;TTY READY
1555  013344  100375                          BPL     PWAIT           ;NO WAIT
1556  013346  112037  177566                  MOVB    (R0)+,@#TPB     ;PRINT CHARACTER
1557  013352  001372                          BNE     PWAIT           ;NEXT IF NOT DONE.
1558  013354  105737  177564          PWAIT1: TSTB    @#TPS
1559  013360  100375                          BPL     PWAIT1
1560  013362  000167  165114          PFRES:  JMP     START
1561  013366  005015  047520  042527  MSGPWF: .ASCIZ  <15><12>.POWER FAILED!.
      013374  020122  040506  046111
      013402  042105  000041
1562          000001                          .END
```

```
ABASE = 000000            425
ACDW1 = 000000            425
ACDW2 = 000000            425
ACPUOP= 000000            425
ACT     013222           1514    1516    1526#
ADALL   012030           1353    1356#
ADDW0 = 000000            425
ADDW1 = 000000            425
ADDW10= 000000            425
ADDW11= 000000            425
ADDW12= 000000            425
ADDW13= 000000            425
ADDW14= 000000            425
ADDW15= 000000            425
ADDW2 = 000000            425
ADDW3 = 000000            425
ADDW4 = 000000            425
ADDW5 = 000000            425
ADDW6 = 000000            425
ADDW7 = 000000            425
ADDW8 = 000000            425
ADDW9 = 000000            425
ADEVCT= 000000            425
ADEVM = 000000            425
AENV  = 000000            425
AENVM   000000            425
AFATAL= 000000            425
AMADR1= 000000            425
AMADR2= 000000            425
AMADR3= 000000            425
AMADR4= 000000            425
AMAMS1= 000000            425
AMAMS2= 000000            425
AMAMS3= 000000            425
AMAMS4= 000000            425
AMSGAD= 000000            425
AMSGLG= 000000            425
AMSGTY= 000000            425
AMTYP1= 000000            425
AMTYP2= 000000            425
AMTYP3= 000000            425
AMTYP4= 000000            425
APASS = 000000            425
APRIOR= 000000            425
ASWREG= 000000            425
ATESTN= 000000            425
ATRAP   012072           1358    1365#
AUNIT = 000000            425
AUSWR = 000000            425
AUTO    012060           1363#
AUTO1   012176           1350    1382#
AVECT1= 000000            425
AVECT2= 000000            425
BEGIN   000572            440     449     452#
```

```
BELL   = 000240            337#
BTRAP    012142           1369    1378#
BUFF     000500            436#    606     612     615     620     623     626     632     634     640     645     657     676
                           682     685     688     691     696     702     704     709     714     726     745     754     760
                           763     768     771     774     780     782     788     793     805     824     830     833     836
                           839     844     850     852     858     863     875     894     903     911     914     917     920
                           925     931     933     939     944     956     982     988     991     996     999    1002    1008
                          1010    1016    1021    1033    1049    1055    1058    1063    1066    1070    1076    1078    1084
                          1088    1100    1118    1127    1134    1139    1145    1151    1165    1183    1200    1217    1225
                          1228    1249    1272    1303    1324    1335    1359    1370    1381    1393    1410    1461    1469
                          1471    1473    1550
CORH     012026           1355#   1366*   1373
CTRAP    012104           1369#   1382
DIS      013066           1445    1491#
DTRAP    012120           1372#   1381
EISFIS   013052           1430    1485#
EMT    = 104000            325#    892
FINISH   013102           1455    1497#
FIRST  =%000002            322#   1428*   1430    1439    1445    1450    1455    1458
FIS      013056           1487#
GIN1     012532           1428#   1435    1438    1444    1449    1454    1477
GIN2     012676           1459#   1478
GIN3     013142           1457    1512#
GOAGIN   013242           1527    1533#
HERE     000650            468#    473*    478*    512
HLT    = 000000            323#
ILLA   = 004700            341#
ILLB   = 000100            342#
INST     013104           1458*   1459*   1464    1471    1476    1498#
INSTC    002276            622#
INSTK    007276           1065#   1066
ITRAP5 = 000004            327#
K0       013120           1326    1338    1504#
K1       000624            458#    519*    520     523     527*    528     531     534*    536     542*    544     550*    552
                           555
K10      000642            465#    566     570     572     575     578     581
K11      000644            466#
K12      000646            467#
K2       000626            459#
K3       000630            460#
K340     013122           1292    1505#
K4       000632            461#
K5       000634            462#    518*    521     526*    535*    537     539     543*    545     547     551*    553
K6       000636            463#    529     570
K7       000640            464#    560     563     566     572     581
LAST   =%000001            321#   1429*   1476
MSG      013264           1517    1538#
MSGPWF   013366           1553    1561#
NOAPT    011054           1243    1246#
NOAPT1   011232           1267    1270#
NOAPT2   011620           1319    1322#
NOAPT3   012254           1389    1392#
NOP      000240            338#
NOR      012044           1359#   1362
```

```
ODD      012476            1417    1419#
PASSPT   013262             452*   1513*   1525*   1537#
PC     =%000007             317#   1419*   1424    1425    1426    1529*
PFRES    013362            1552    1560#
PWAIT    013340            1554#   1555    1557
PWAIT1   013354            1558#   1559
PWRDWN   013302             437    1546#   1549
PWRUP    013312            1546    1549#
RA       005436             893     897#
RA1      003662             744     748#
RB       005422             892*    895#    897*    898
RBBB     005424             891     896#
RB1      003646             743*    746#    748*    749
RB1AA    003650             742     747#
RC       005416             894#    899
RC1      003642             745#    750
REES     012430            1391    1411    1412#
REES1    012416            1387    1411#
RESET2   011544            1304    1311#
RESTRT   000600             453#   1535
RET      012730            1460    1467#
RETA     002200             607     610#
RETAT    010040            1119    1125#
RETA1    003034             677     680#
RETA2    003752             755     758#
RETA3    004606             825     828#
RETA4    005526             904     907#
RETA5    006362             983     986#
RETB     002230             613     615#
RETBT    010114            1128    1134#
RETB1    003064             683     685#
RETB2    004002             761     763#
RETB3    004636             831     833#
RETB4    005556             912     914#
RETB5    006412             989     991#
RETC     002300             621     623#
RETCT    010174            1140    1145#
RETC1    003134             689     691#
RETC2    004052             769     771#
RETC3    004706             837     839#
RETC4    005626             918     920#
RETC5    006462             997     999#
RETD     002364             627     632#
RETD1    003220             697     702#
RETD2    004136             775     780#
RETD3    004772             845     850#
RETD4    005712             926     931#
RETD5    006546            1003    1008#
RETE     002436             635     640#
RETE1    003270             705     709#
RETE2    004210             783     788#
RETE3    005044             853     858#
RETE4    005764             934     939#
RETE5    006620            1011    1016#
```

```
RETF     002514              646     649#
RETF1    003346              715     718#
RETF2    004266              794     797#
RETF3    005122              864     867#
RETF4    006042              945     948#
RETF5    006676             1022    1025#
RETG     002644              658     661#
RETG1    003476              727     730#
RETG2    004416              806     809#
RETG3    005252              876     879#
RETG4    006172              957     960#
RETG5    007026             1034    1037#
RETH5    007200             1050    1053#
RETJ     007230             1056    1058#
RETK     007300             1064    1066#
RETL     007364             1071    1076#
RETM     007436             1079    1084#
RETN     007514             1089    1092#
RETO     007642             1101    1104#
RET1     012760             1470    1471#
RET2     013002             1472    1473#
RET3     013022             1474    1475#
RET4     013010             1422    1474#
RSTP1    002746              644     670#
RSTP2    006274              943     969#
RSTP3    011532             1302    1310#
RSTP4    011762             1317    1342#
RSTP5    012464             1416    1418#
RST1     002760              670     671#
RST2     006306              969     970#
RST4     011774             1342    1343#
RTI1     010450             1185    1189#
RTI2     010464             1186    1191#
RTRAP  = 000010              340#    607*    613*    621*    627*    635*    646*    647*    658*    659*
RTRAP1= 000034               332#    677*    683*    689*    697*    705*    715*    716*    727*    728*
RTRAP2= 000020               331#    755*    761*    769*    775*    783*    794*    795*    806*    807*
RTRAP3= 000030               330#    825*    831*    837*    845*    853*    864*    865*    876*    877*
RTRAP4= 000014               329#    904*    912*    918*    926*    934*    945*    946*    957*    958*    1119*   1128*   1140*
RTRAP5= 000004               328#    983*    989*    997*   1003*   1011*   1022*   1023*   1034*   1035*   1050*   1056*   1064*
                            1071*   1079*   1089*   1090*   1101*   1102*
RTT1     010260             1154    1157#
RTT2     010276             1155    1160#
RTT3     010344             1167    1171#
RTT4     010364             1168    1175#
RTT5     010316             1165#   1173    1178
RTT6     010406             1176    1179#
R0     -%000000              320#    447*    448     1365*   1366    1368*   1371    1372*   1373    1517*   1520    1526*   1529
                            1553*   1556
R1       %000001            1152*   1169*   1171*   1175*   1187*   1189*   1191
R2       %000002             475*    480*    485*    491*    497*    503*    509*    514*    524*    532*    540*    548*    556*
                             561*    564*    568*    571*    573*    576*    579*    582*    589*    590*    591*    592*    599*
                             600*    601*    602*    609*    616*    624*    633*    641*    650*    651*    652*    653*    656*
                             662*    663*    664*    665*    670*    679*    686*    692*    703*    710*    719*    720*    721*
                             722*    725*    731*    732*    733*    734*    739*    747*    757*    764*    772*    781*    789*
```

TR2	011174	1255	1262#		
TR3	011316	1276	1281#		
TR4	011332	1277	1283#		
TR5	011320	1265	1278	1282#	
TSL	012024	1354#			
TST1	000652	457	471#		
TST10	002322	619	624	625#	
TST11	002460	625	641	644#	
TST12	002772	675#			
TST13	003034	675	681#.		
TST14	003104	681	686	687#	
TST15	003156	687	692	695#	
TST16	003312	695	710	713#	
TST17	003612	713	739	742#	
TST2	001150	471	514	517#	
TST20	003710	753#			
TST21	003752	753	759#		
TST22	004022	759	764	767#	
TST23	004074	767	772	773#	
TST24	004232	773	789	792#	
TST25	004544	823#			
TST26	004606	823	829#		
TST27	004656	829	834	835#	
TST3	001474	517	556	559#	
TST30	004730	835	840	843#	
TST31	005066	843	859	862#	
TST32	005366	862	888	891#	
TST33	005464	902#			
TST34	005526	902	910#		
TST35	005576	910	915	916#	
TST36	005650	916	921	924#	
TST37	006006	924	940	943#	
TST4	001730	559	568	582	585#
TST40	006320	981#			
TST41	006362	981	987#		
TST42	006432	987	992	995#	
TST43	006504	995	1000	1001#	
TST44	006642	1001	1017	1020#	
TST45	007136	1020	1045	1048#	
TST46	007200	1048	1054#		
TST47	007250	1054	1059	1062#	
TST5	002136	585	602	605#	
TST50	007323	1062	1067	1069#	
TST51	007460	1069	1085	1087#	
TST52	007764	1117#			
TST53	010040	1117	1126#		
TST54	010134	1126	1135	1138#	
TST55	010216	1138	1146	1149#	
TST56	010276	1149	1158	1163#	
TST57	010406	1163	1182#		
TST6	002200	605	611#		
TST60	010502	1182	1193	1196#	
TST61	010632	1216#			
TST62	010734	1216	1226	1227#	

```
TST63   011022          1227    1241#
TST64   011200          1245    1265#
TST65   011364          1269    1291#
TST66   011466          1291    1299    1302#
TST67   011566          1317#
TST7    002250           611     616     619#
TST70   012006          1321    1350#
TST71   012222          1387#
TST72   012444          1416#
TST73   012500          1422#
TTCSR = 177564           333#   1253*   1271*   1275*   1293*   1296    1328*   1339*   1343*
TTY3    011670          1325    1331#
TTY4    011750          1336    1340#
WAIT    013170          1518#   1519    1521
WAIT1   013204          1522#   1523
WATE    012362          1394    1407#
WATE1   012300          1396#   1397
WATE2   012314          1399#   1400
WATE3   012346          1405#   1410
$APTHD  000450           426#
$CPUOP  000426           425#    442*    450*    1432
$DEVCT  000410           425#
$ENDAD  013232           424    1529#
$ENV    000420           425#    439     1242    1266    1318    1388
$ENVM   000421           425#    441*    445*    1515    1551
$ERN  = 000253           264#    475#    480#    485#    491#    497#    503#    509#    514#    524#    532#    540#    548#
                         556#    561#    564#    568#    571#    573#    576#    579#    582#    589#    590#    591#    592#
                         599#    600#    601#    602#    609#    616#    624#    633#    641#    650#    651#    652#    653#
                         656#    662#    663#    664#    665#    670#    679#    686#    692#    703#    710#    719#    720#
                         721#    722#    725#    731#    732#    733#    734#    739#    747#    757#    764#    772#    781#
                         789#    798#    799#    800#    801#    804#    810#    811#    812#    813#    818#    827#    834#
                         840#    851#    859#    868#    869#    870#    871#    874#    880#    881#    882#    883#    888#
                         896#    906#    915#    921#    932#    940#    949#    950#    951#    952#    955#    961#    962#
                         963#    964#    969#    985#    992#   1000#   1009#   1017#   1026#   1027#   1028#   1029#   1032#
                        1038#   1039#   1040#   1041#   1045#   1052#   1059#   1067#   1077#   1085#   1093#   1094#   1095#
                        1096#   1099#   1105#   1106#   1107#   1108#   1112#   1124#   1133#   1135#   1146#   1158#   1174#
                        1178#   1190#   1193#   1209#   1211#   1224#   1226#   1235#   1260#   1261#   1282#   1297#   1299#
                        1310#   1330#   1333#   1342#   1363#   1374#   1380#   1382#   1406#   1409#   1411#   1418#   1470#
                        1472#   1474#
$ERROR= 000402           344#    456*
$ETABL  000420           425#
$ETEND  000450           425#    426
$FATAL  000402           344     425#    475*    480*    485*    491*    497*    503*    509*    514*    524*    532*    540*
                         548*    556*    561*    564*    568*    571*    573*    576*    579*    582*    589*    590*    591*
                         592*    599*    600*    601*    602*    609*    616*    624*    633*    641*    650*    651*    652*
                         653*    656*    662*    663*    664*    665*    670*    679*    686*    692*    703*    710*    719*
                         720*    721*    722*    725*    731*    732*    733*    734*    739*    747*    757*    764*    772*
                         781*    789*    798*    799*    800*    801*    804*    810*    811*    812*    813*    818*    827*
                         834*    840*    851*    859*    868*    869*    870*    871*    874*    880*    881*    882*    883*
                         888*    896*    906*    915*    921*    932*    940*    949*    950*    951*    952*    955*    961*
                         962*    963*    964*    969*    985*    992*   1000*   1009*   1017*   1026*   1027*   1028*   1029*
                        1032*   1038*   1039*   1040*   1041*   1045*   1052*   1059*   1067*   1077*   1085*   1093*   1094*
                        1095*   1096*   1099*   1105*   1106*   1107*   1108*   1112*   1124*   1133*   1135*   1146*   1158*
                        1174*   1178*   1190*   1193*   1209*   1211*   1224*   1226*   1235*   1260*   1261*   1282*   1297*
```

		1299*	1310*	1330*	1333*	1342*	1363*	1374*	1380*	1382*	1406*	1409*	1411*	1418*
		1470*	1472*	1474*	1507*									
$HIBTS	000450	426#												
$MADR1	000432	425#												
$MADR2	000436	425#												
$MADR3	000442	425#												
$MADR4	000446	425#												
$MAIL	000400	425#	426											
$MAMS1	000430	425#												
$MAMS2	000434	425#												
$MAMS3	000440	425#												
$MAMS4	000444	425#												
$MBADR	000452	426#												
$MSGAD	000414	425#												
$MSGLG	000416	425#												
$MSGTY	000400	425#	453	454*										
$MTYP1	000431	425#												
$MTYP2	000435	425#												
$MTYP3	000441	425#												
$MTYP4	000445	425#												
$PASS	000406	425#	433*	1244	1268	1320	1390	1512*						
$PASTM	000456	426#												
$SVPC =	000400	424#												
$SWR =	000000	262#												
$SWREG	000422	425#	443	447	1436	1441	1447	1452						
$TESTN	000404	343	425#	471*	517*	559*	585*	605*	611*	619*	625*	644*	675*	681*
		687*	695*	713*	742*	753*	759*	767*	773*	792*	823*	829*	835*	843*
		862*	891*	902*	910*	916*	924*	943*	981*	987*	995*	1001*	1020*	1048*
		1054*	1062*	1069*	1087*	1117*	1126*	1138*	1149*	1163*	1182*	1196*	1216*	1227*
		1241*	1265*	1291*	1302*	1317*	1350*	1387*	1416*	1422*				
$TN -	000074	263#	471#	514	517#	556	559#	568	582	585#	602	605#	611#	616
		619#	624	625#	641	644#	675#	681#	686	687#	692	695#	710	713#
		739	742#	753#	759#	764	767#	772	773#	789	792#	823#	829#	834
		835#	840	843#	859	862#	888	891#	902#	910#	915	916#	921	924#
		940	943#	981#	987#	992	995#	1000	1001#	1017	1020#	1045	1048#	1054#
		1059	1062#	1067	1069#	1085	1087#	1117#	1126#	1135	1138#	1146	1149#	1158
		1163#	1182#	1193	1196#	1216#	1226	1227#	1241#	1265#	1291#	1299	1302#	1317#
		1350#	1387#	1416#	1422#									
$TSTM	000454	426#												
$TSTNM=	000404	343#	455*											
$UNIT	000412	425#												
$UNITM	000460	426#												
$USWR	000424	425#												
$X =	012514	471#	475	480	485	491	497	503	509	514	517#	524	532	540
		548	556	559#	561	564	568	571	573	576	579	582	585#	589
		590	591	592	599	600	601	602	605#	609	611#	616	619#	624
		625#	633	641	644#	650	651	652	653	656	662	663	664	665
		670	675#	679	681#	686	687#	692	695#	703	710	713#	719	720
		721	722	725	731	732	733	734	739	742#	747	753#	757	759#
		764	767#	772	773#	781	789	792#	798	799	800	801	804	810
		811	812	813	818	823#	827	829#	834	835#	840	843#	851	859
		862#	868	869	870	871	874	880	881	882	883	888	891#	896
		902#	906	910#	915	916#	921	924#	932	940	943#	949	950	951
		952	955	961	962	963	964	969	981#	985	987#	992	995#	1000

```
                1221  1224  1226  1227  1235  1241  1248  1260  1261  1265  1282  1291  1297
                1299  1302  1306  1310  1317  1330  1333  1342  1350  1363  1374  1380  1382
                1387  1406  1409  1411  1416  1418  1422  1470  1472  1474  1497
.$X     000450  426#
```

ERROR	229#	475	480	485	491	497	503	509	514	524	532	540	548	556	561
	564	568	571	573	576	579	582	589	590	591	592	599	600	601	602
	609	616	624	633	641	650	651	652	653	656	662	663	664	665	670
	679	686	692	703	710	719	720	721	722	725	731	732	733	734	739
	747	757	764	772	781	789	798	799	800	801	804	810	811	812	813
	818	827	834	840	851	859	868	869	870	871	874	880	881	882	883
	888	896	906	915	921	932	940	949	950	951	952	955	961	962	963
	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039	1040
	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106	1107
	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224	1226
	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382	1406
	1409	1411	1418	1470	1472	1474									
LOOP	295#	475	480	485	491	497	503	509	514	524	532	540	548	556	561
	564	568	571	573	576	579	582	589	590	591	592	599	600	601	602
	609	616	624	633	641	650	651	652	653	656	662	663	664	665	670
	679	686	692	703	710	719	720	721	722	725	731	732	733	734	739
	747	757	764	772	781	789	798	799	800	801	804	810	811	812	813
	818	827	834	840	851	859	868	869	870	871	874	880	881	882	883
	888	896	906	915	921	932	940	949	950	951	952	955	961	962	963
	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039	1040
	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106	1107
	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224	1226
	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382	1406
	1409	1411	1418	1470	1472	1474									
MFPS	225#	595	654	666	723	735	802	814	872	884	953	965	1030	1042	1097
	1109	1331	1340	1378	1407										
MTPS	221#	588	597	629	637	699	707	777	785	847	855	928	936	1005	1013
	1073	1081	1251	1258	1274	1292	1312	1326	1338	1404	1463				
NEWTST	283#	471	517	559	585	605	611	619	625	644	675	681	687	695	713
	742	753	759	767	773	792	823	829	835	843	862	891	902	910	916
	924	943	981	987	995	1001	1020	1048	1054	1062	1069	1087	1117	1126	1138
	1149	1163	1182	1196	1216	1227	1241	1265	1291	1302	1317	1350	1387	1416	1422
STARS	291#	424	425	426	471	517	559	585	605	611	619	625	644	675	681
	687	695	713	742	753	759	767	773	792	823	829	835	843	862	891
	902	910	916	924	943	981	987	995	1001	1020	1048	1054	1062	1069	1087
	1117	1126	1138	1149	1163	1182	1196	1216	1227	1241	1265	1291	1302	1317	1350
	1387	1416	1422												
$$ERCD	256#	475	480	485	491	497	503	509	514	524	532	540	548	556	561
	564	568	571	573	576	579	582	589	590	591	592	599	600	601	602
	609	616	624	633	641	650	651	652	653	656	662	663	664	665	670
	679	686	692	703	710	719	720	721	722	725	731	732	733	734	739
	747	757	764	772	781	789	798	799	800	801	804	810	811	812	813
	818	827	834	840	851	859	868	869	870	871	874	880	881	882	883
	888	896	906	915	921	932	940	949	950	951	952	955	961	962	963
	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039	1040
	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106	1107
	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224	1226
	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382	1406
	1409	1411	1418	1470	1472	1474									
$$ERNU	250#	475	480	485	491	497	503	509	514	524	532	540	548	556	561
	564	568	571	573	576	579	582	589	590	591	592	599	600	601	602
	609	616	624	633	641	650	651	652	653	656	662	663	664	665	670
	679	686	692	703	710	719	720	721	722	725	731	732	733	734	739
	747	757	764	772	781	789	798	799	800	801	804	810	811	812	813

	818	827	834	840	851	859	868	869	870	871	874	880	881	882	883
	888	896	906	915	921	932	940	949	950	951	952	955	961	962	963
	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039	1040
	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106	1107
	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224	1226
	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382	1406
	1409	1411	1418	1470	1472	1474									
$$ERRO	245#	514	556	568	582	602	616	624	641	686	692	710	739	764	772
	789	834	840	859	888	915	921	940	992	1000	1017	1045	1059	1067	1085
	1135	1146	1158	1193	1226	1299									
$$LOOP	305#	475	480	485	491	497	503	509	514	524	532	540	548	556	561
	564	568	571	573	576	579	582	589	590	591	592	599	600	601	602
	609	616	624	633	641	650	651	652	653	656	662	663	664	665	670
	679	686	692	703	710	719	720	721	722	725	731	732	733	734	739
	747	757	764	772	781	789	798	799	800	801	804	810	811	812	813
	818	827	834	840	851	859	868	869	870	871	874	880	881	882	883
	888	896	906	915	921	932	940	949	950	951	952	955	961	962	963
	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039	1040
	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106	1107
	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224	1226
	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382	1406
	1409	1411	1418	1470	1472	1474									
$$NEWT	267#	471	517	559	585	605	611	619	625	644	675	681	687	695	713
	742	753	759	767	773	792	823	829	835	843	862	891	902	910	916
	924	943	981	987	995	1001	1020	1048	1054	1062	1069	1087	1117	1126	1138
	1149	1163	1182	1196	1216	1227	1241	1265	1291	1302	1317	1350	1387	1416	1422
.$ACT1	419#	424													
.$APTB	418#	425													
.$APTH	417#	426													

ADD	1434	1443													
BCC	589	653	722	801	871	952	1029	1096							
BCS	599	665	734	813	883	964	1041	1108							
BEQ	444	449	475	480	485	491	497	503	509	514	524	532	540	548	556
	561	564	568	571	573	579	601	616	624	633	641	656	663	670	686
	692	703	710	725	732	739	764	772	781	789	804	811	818	834	840
	851	859	874	881	888	915	921	932	940	955	962	969	992	1000	1009
	1017	1032	1039	1045	1059	1067	1077	1085	1099	1106	1112	1135	1146	1158	1173
	1176	1178	1193	1211	1243	1267	1297	1299	1319	1333	1342	1374	1380	1382	1389
	1409	1411	1433	1437	1442	1448	1453	1470	1472	1474	1477	1527			
BHIS	750	899													
BIC	668	737	816	886	967	1271	1392	1412							
BIS	450	596	1328	1339	1402										
BISB	445														
BIT	448	655	724	8[illegible]	873	954	1031	1225	1242	1266	1296	1298	1318	1388	1432
	1436	1441	1447	1452											
BITB	443	1515	1551												
BLOS	1362														
BMI	602	662	731	810	880	961	1038	1105							
BNE	440	471	517	559	576	582	585	591	605	611	619	625	644	651	675
	681	687	695	713	720	742	753	759	767	773	792	799	823	829	835
	843	862	869	891	902	910	916	924	943	950	981	987	995	1001	1020
	1027	1048	1054	1062	1069	1087	1094	1117	1126	1138	1149	1163	1182	1196	1216
	1226	1227	1241	1245	1265	1269	1291	1302	1317	1321	1350	1387	1391	1416	1422
	1431	1440	1446	1451	1456	1514	1516	1521	1552	1557					
BPL	592	650	719	798	868	949	1026	1093	1248	1397	1400	1519	1523	1555	1559
BR	1353	1435	1438	1444	1449	1454	1499	1500	1501	1502					
BVC	590	652	721	800	870	951	1028	1095							
BVS	600	664	733	812	882	963	1040	1107							
CCC	594	630	700	778	848	929	1006	1074							
CLR	433	441	442	454	455	456	472	482	487	488	493	494	499	500	505
	506	587	628	647	672	698	716	752	776	795	820	846	865	901	927
	946	971	1004	1023	1072	1090	1114	1152	1169	1187	1202	1203	1219	1238	1257
	1262	1283	1284	1311	1314	1337	1343	1356	1357	1384	1395	1403	1462	1534	
CMP	471	474	479	484	490	496	502	508	513	517	523	531	539	547	555
	559	585	605	611	615	619	623	625	632	640	644	669	675	681	685
	687	691	695	702	709	713	738	742	749	753	759	763	767	771	773
	780	788	792	817	823	829	833	835	839	843	850	858	862	887	891
	898	902	910	914	916	920	924	931	939	943	968	981	987	991	995
	999	1001	1008	1016	1020	1044	1048	1054	1058	1062	1066	1069	1076	1084	1087
	1111	1117	1126	1134	1138	1145	1149	1163	1182	1196	1216	1227	1241	1265	1291
	1302	1317	1332	1350	1361	1373	1381	1387	1410	1416	1422	1430	1439	1445	1450
	1455	1469	1471	1476											
CMPB	489	495	501	507	512	560	563	566	570	572	575	578	581		
DEC	1175	1365	1419												
EMT	826	832	838	849	857	866	878	895							
HALT	323	351	353	355	357	359	361	363	365	367	369	371	373	375	377
	379	381	383	385	387	389	391	393	395	397	399	401	403	405	407
	409	411	413	415	475	480	485	491	497	503	509	514	524	532	540
	548	556	561	564	568	571	573	576	579	582	589	590	591	592	599
	600	601	602	609	616	624	633	641	650	651	652	653	656	662	663
	664	665	670	679	686	692	703	710	719	720	721	722	725	731	732
	733	734	739	747	757	764	772	781	789	798	799	800	801	804	810
	811	812	813	818	827	834	840	851	859	868	869	870	871	874	880

D 7

	881	882	883	888	896	906	915	921	932	940	949	950	951	952	955
	961	962	963	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032
	1038	1039	1040	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099
	1105	1106	1107	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209
	1211	1224	1226	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374
	1380	1382	1406	1409	1411	1418	1470	1472	1474	1498	1509	1547			
INC	471	475	480	485	491	497	503	509	514	517	524	532	540	548	556
	559	561	564	568	571	573	576	579	582	585	589	590	591	592	599
	600	601	602	605	609	611	616	619	624	625	633	641	644	650	651
	652	653	656	662	663	664	665	670	675	679	681	686	687	692	695
	703	710	713	719	720	721	722	725	731	732	733	734	739	742	747
	748	753	757	759	764	767	772	773	781	789	792	798	799	800	801
	804	810	811	812	813	818	823	827	829	834	835	840	843	851	859
	862	868	869	870	871	874	880	881	882	883	888	891	896	897	902
	906	910	915	916	921	924	932	940	943	949	950	951	952	955	961
	962	963	964	969	981	985	987	992	995	1000	1001	1009	1017	1020	1026
	1027	1028	1029	1032	1038	1039	1040	1041	1045	1048	1052	1054	1059	1062	1067
	1069	1077	1085	1087	1093	1094	1095	1096	1099	1105	1106	1107	1108	1112	1117
	1124	1126	1133	1135	1138	1146	1149	1158	1163	1171	1172	1174	1177	1178	1182
	1189	1190	1193	1196	1209	1210	1211	1216	1224	1226	1227	1235	1241	1260	1261
	1265	1282	1291	1297	1299	1302	1310	1317	1330	1333	1342	1350	1363	1372	1374
	1380	1382	1387	1406	1409	1411	1416	1418	1422	1459	1470	1472	1474	1508	1512
INCB	1513														
IOT	756	762	770	779	787	796	808	1208	1281						
JMP	431	434	457	984	990	998	1007	1015	1024	1036	1417	1457	1464	1478	1535
	1560														
JSR	1051	1057	1065	1075	1083	1091	1103	1529							
MOV	437	438	447	452	453	475	477	480	485	491	497	503	509	511	514
	518	519	520	521	524	526	527	528	529	532	534	535	536	537	540
	542	543	544	545	548	550	551	552	553	556	561	564	568	571	573
	576	579	582	589	590	591	592	599	600	601	602	606	607	609	612
	613	616	620	621	624	626	627	633	634	635	636	641	645	646	650
	65.	652	653	656	657	658	659	662	663	664	665	667	670	671	676
	677	679	682	683	686	688	689	692	696	697	703	704	705	706	710
	714	715	719	720	721	722	725	726	727	728	731	732	733	734	736
	739	743	744	745	747	751	754	755	757	760	761	764	768	769	772
	774	775	781	782	783	784	789	793	794	798	799	800	801	804	805
	806	807	810	811	812	813	815	818	819	824	825	827	830	831	834
	836	837	840	844	845	851	852	853	854	859	863	864	868	869	870
	871	874	875	876	877	880	881	882	883	885	888	892	893	894	896
	900	903	904	906	911	912	915	917	918	921	925	926	932	933	934
	935	940	944	945	949	950	951	952	955	956	957	958	961	962	963
	964	966	969	970	982	983	985	988	989	992	996	997	1000	1002	1003
	1009	1010	1011	1012	1017	1021	1022	1026	1027	1028	1029	1032	1033	1034	1035
	1038	1039	1040	1041	1043	1045	1049	1050	1052	1055	1056	1059	1063	1064	1067
	1070	1071	1077	1078	1079	1080	1085	1088	1089	1093	1094	1095	1096	1098	1099
	1100	1101	1102	1105	1106	1107	1108	1110	1112	1113	1118	1119	1120	1121	1124
	1127	1128	1129	1130	1133	1135	1139	1140	1141	1142	1146	1151	1153	1154	1155
	1158	1164	1165	1166	1167	1168	1174	1178	1183	1184	1185	1186	1190	1193	1199
	1200	1201	1204	1205	1206	1209	1211	1212	1213	1217	1218	1220	1221	1224	1226
	1228	1229	1230	1231	1235	1237	1249	1250	1252	1253	1254	1255	1256	1260	1261
	1272	1273	1275	1276	1277	1278	1279	1282	1285	1286	1287	1293	1294	1297	1299
	1303	1304	1305	1306	1310	1313	1324	1325	1327	1330	1333	1335	1336	1342	1344
	1358	1359	1363	1366	1368	1369	1370	1374	1380	1382	1383	1393	1394	1398	1401

	1406	1409	1411	1413	1418	1423	1424	1425	1426	1427	1428	1429	1458	1460	1461
	1467	1468	1470	1472	1474	1475	1506	1507	1517	1525	1526	1533	1546	1549	1550
	1553														
MOVB	473	478	483	522	530	538	546	554	1520	1556					
NOP	1123	1132	1157	1223	1234	1329	1530	1531	1532						
RESET	1295	1308	1309	1323	1334	1524	1528								
RTI	1122	1131	1143	1188	1222	1232									
RTT	1156	1170	1207	1307											
SCC	586	638	786	856	937	1014	1082								
TRAP	678	684	690	701	708	717	729	746	1259	1280					
TST	1191	1244	1268	1320	1341	1379	1390	1408	1473						
TSTB	439	1247	1360	1371	1396	1399	1518	1522	1554	1558					
WAIT	1405														
.ABS	345														
.ASCIZ	1538	1561													
.BYTE	425														
.END	1562														
.ENDC	424	425	475	480	485	491	497	503	509	514	524	532	540	548	556
	561	564	568	571	573	576	579	582	589	590	591	592	599	600	601
	602	609	616	624	633	641	650	651	652	653	656	662	663	664	665
	670	679	686	692	703	710	719	720	721	722	725	731	732	733	734
	739	747	757	764	772	781	789	798	799	800	801	804	810	811	812
	813	818	827	834	840	851	859	868	869	870	871	874	880	881	882
	883	888	896	906	915	921	932	940	949	950	951	952	955	961	962
	963	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039
	1040	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106
	1107	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224
	1226	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382
	1406	1409	1411	1418	1470	1472	1474								
.EVEN	425														
.IF	424	425	475	480	485	491	497	503	509	514	524	532	540	548	556
	561	564	568	571	573	576	579	582	589	590	591	592	599	600	601
	602	609	616	624	633	641	650	651	652	653	656	662	663	664	665
	670	679	686	692	703	710	719	720	721	722	725	731	732	733	734
	739	747	757	764	772	781	789	798	799	800	801	804	810	811	812
	813	818	827	834	840	851	859	868	869	870	871	874	880	881	882
	883	888	896	906	915	921	932	940	949	950	951	952	955	961	962
	963	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039
	1040	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106
	1107	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224
	1226	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382
	1406	1409	1411	1418	1470	1472	1474								
.IFF	424	475	480	485	491	497	503	509	514	524	532	540	548	556	561
	564	568	571	573	576	579	582	589	590	591	592	599	600	601	602
	609	616	624	633	641	650	651	652	653	656	662	663	664	665	670
	679	686	692	703	710	719	720	721	722	725	731	732	733	734	739
	747	757	764	772	781	789	798	799	800	801	804	810	811	812	813
	818	827	834	840	851	859	868	869	870	871	874	880	881	882	883
	888	896	906	915	921	932	940	949	950	951	952	955	961	962	963
	964	969	985	992	1000	1009	1017	1026	1027	1028	1029	1032	1038	1039	1040
	1041	1045	1052	1059	1067	1077	1085	1093	1094	1095	1096	1099	1105	1106	1107
	1108	1112	1124	1133	1135	1146	1158	1174	1178	1190	1193	1209	1211	1224	1226
	1235	1260	1261	1282	1297	1299	1310	1330	1333	1342	1363	1374	1380	1382	1406
	1409	1411	1418	1470	1472	1474									

.IFT 475 480 485 491 497 503 509 514 524 532 540 548 556 561 564
568 571 573 576 579 582 589 590 591 592 599 600 601 602 609
616 624 633 641 650 651 652 653 656 662 663 664 665 670 679
686 692 703 710 719 720 721 722 725 731 732 733 734 739 747
757 764 772 781 789 798 799 800 801 804 810 811 812 813 818
827 834 840 851 859 868 869 870 871 874 880 881 882 883 888
896 906 915 921 932 940 949 950 951 952 955 961 962 963 964
969 985 992 1000 1009 1017 1026 1027 1028 1029 1032 1038 1039 1040 1041
1045 1052 1059 1067 1077 1085 1093 1094 1095 1096 1099 1105 1106 1107 1108
1112 1124 1133 1135 1146 1158 1174 1178 1190 1193 1209 1211 1224 1226 1235
1260 1261 1282 1297 1299 1310 1330 1333 1342 1363 1374 1380 1382 1406 1409
1411 1418 1470 1472 1474

.IIF 425 471 475 480 485 491 497 503 509 514 517 524 532 540 548
556 559 561 564 568 571 573 576 579 582 585 589 590 591 592
599 600 601 602 605 609 611 616 619 624 625 633 641 644 650
651 652 653 656 662 663 664 665 670 675 679 681 686 687 692
695 703 710 713 719 720 721 722 725 731 732 733 734 739 742
747 753 757 759 764 767 772 773 781 789 792 798 799 800 801
804 810 811 812 813 818 823 827 829 834 835 840 843 851 859
862 868 869 870 871 874 880 881 882 883 888 891 896 902 906
910 915 916 921 924 932 940 943 949 950 951 952 955 961 962
963 964 969 981 985 987 992 995 1000 1001 1009 1017 1020 1026 1027
1028 1029 1032 1038 1039 1040 1041 1045 1048 1052 1054 1059 1062 1067 1069
1077 1085 1087 1093 1094 1095 1096 1099 1105 1106 1107 1108 1112 1117 1124
1126 1133 1135 1138 1146 1149 1158 1163 1174 1178 1182 1190 1193 1196 1209
1211 1216 1224 1226 1227 1235 1241 1260 1261 1265 1282 1291 1297 1299 1302
1310 1317 1330 1333 1342 1350 1363 1374 1380 1382 1387 1406 1409 1411 1416
1418 1422 1470 1472 1474

.LIST 3 265 309 314 416 425 471 475 480 485 491 497 503 509 514
517 524 532 540 548 556 559 561 564 568 571 573 576 579 582
585 589 590 591 592 599 600 601 602 605 609 611 616 619 624
625 633 641 644 650 651 652 653 656 662 663 664 665 670 675
679 681 686 687 692 695 703 710 713 719 720 721 722 725 731
732 733 734 739 742 747 753 757 759 764 767 772 773 781 789
792 798 799 800 801 804 810 811 812 813 818 823 827 829 834
835 840 843 851 859 862 868 869 870 871 874 880 881 882 883
888 891 896 902 906 910 915 916 921 924 932 940 943 949 950
951 952 955 961 962 963 964 969 981 985 987 992 995 1000 1001
1009 1017 1020 1026 1027 1028 1029 1032 1038 1039 1040 1041 1045 1048 1052
1054 1059 1062 1067 1069 1077 1085 1087 1093 1094 1095 1096 1099 1105 1106
1107 1108 1112 1117 1124 1126 1133 1135 1138 1146 1149 1158 1163 1174 1178
1182 1190 1193 1196 1209 1211 1216 1224 1226 1227 1235 1241 1260 1261 1265
1282 1291 1297 1299 1302 1310 1317 1330 1333 1342 1350 1363 1374 1380 1382
1387 1406 1409 1411 1416 1418 1422 1470 1472 1474

.MACRO 221 225 229 245 250 256 267 283 291 295 305
.MCALL 417 418 419
.MEXIT 425

.NLIST 1 220 266 313 346 425 471 475 480 485 491 497 503 509 514
517 524 532 540 548 556 559 561 564 568 571 573 576 579 582
585 589 590 591 592 599 600 601 602 605 609 611 616 619 624
625 633 641 644 650 651 652 653 656 662 663 664 665 670 675
679 681 686 687 692 695 703 710 713 719 720 721 722 725 731
732 733 734 739 742 747 753 757 759 764 767 772 773 781 789
792 798 799 800 801 804 810 811 812 813 818 823 827 829 834

	835	840	843	851	859	862	868	869	870	871	874	880	881	882	883
	888	891	896	902	906	910	915	916	921	924	932	940	943	949	950
	951	952	955	961	962	963	964	969	981	985	987	992	995	1000	1001
	1009	1017	1020	1026	1027	1028	1029	1032	1038	1039	1040	1041	1045	1048	1052
	1054	1059	1062	1067	1069	1077	1085	1087	1093	1094	1095	1096	1099	1105	1106
	1107	1108	1112	1117	1124	1126	1133	1135	1138	1146	1149	1158	1163	1174	1178
	1182	1190	1193	1196	1209	1211	1216	1224	1226	1227	1235	1241	1260	1261	1265
	1282	1291	1297	1299	1302	1310	1317	1330	1333	1342	1350	1363	1374	1380	1382
	1387	1406	1409	1411	1416	1418	1422	1470	1472	1474					
.REM	4														
.REPT	348														
.SBTTL	424	425	426	471	517	559	585	605	611	619	625	644	675	681	687
	695	713	742	753	759	767	773	792	823	829	835	843	862	891	902
	910	916	924	943	981	987	995	1001	1020	1048	1054	1062	1069	1087	1117
	1126	1138	1149	1163	1182	1196	1216	1227	1241	1265	1291	1302	1317	1350	1387
	1416	1422													
.TITLE	2														
.WORD	424	425	426	588	595	597	629	637	654	666	699	707	723	735	777
	785	802	814	847	855	872	884	928	936	953	965	1005	1013	1030	1042
	1073	1081	1097	1109	1251	1258	1274	1292	1312	1326	1331	1338	1340	1378	1404
	1407	1463	1479	1536											

ERRORS DETECTED: 0

```
*CVKALA,CVKALA/CRF/DS:ERFLZ=CVKALA.P11
RUN-TIME:  21 13 2 SECONDS
CORE USED:  11K
```