KD11-Z

11/44 TRAPS

CKKABA0

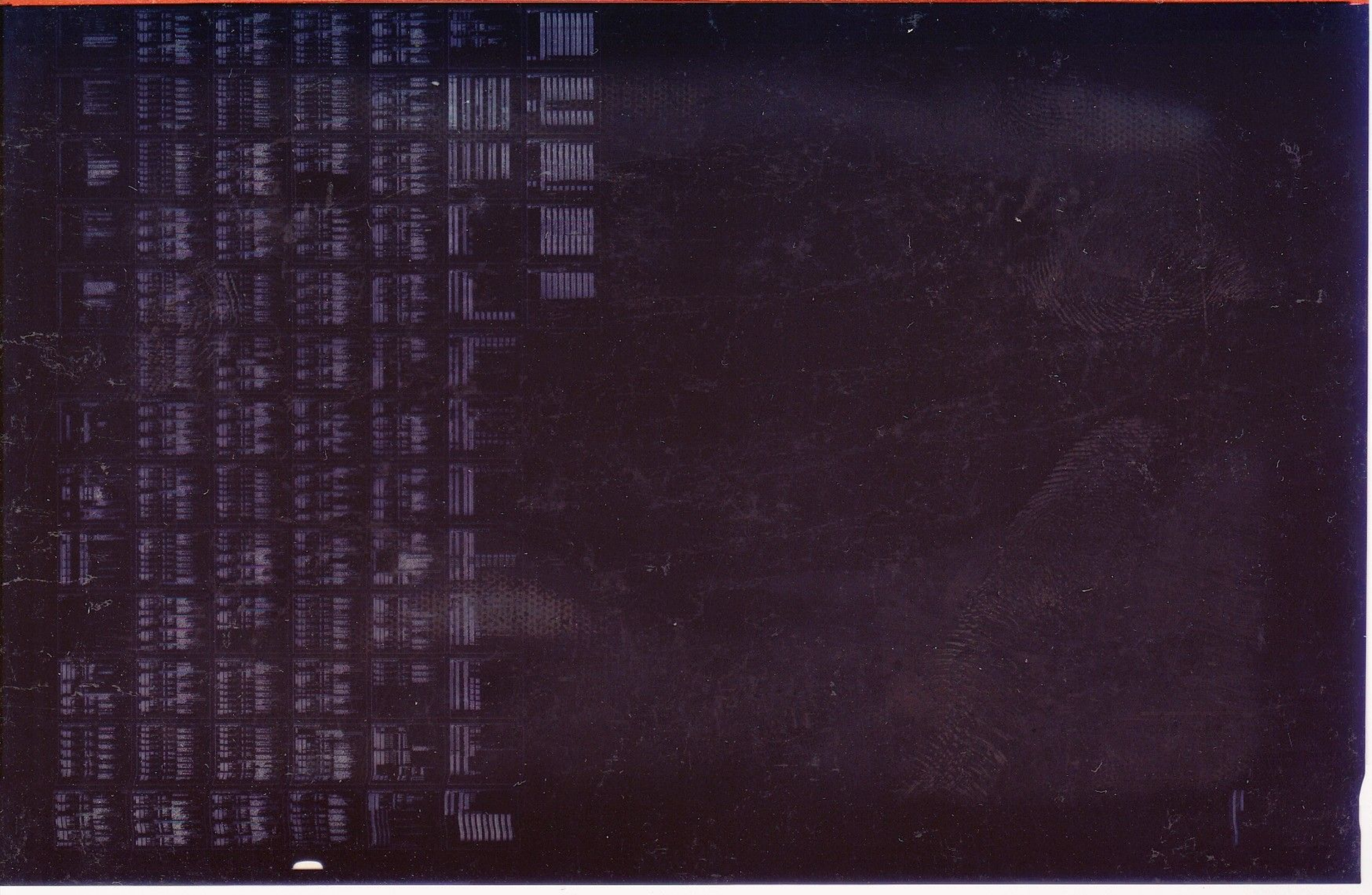
AH-F623A-MC

FICHE 1 OF 1

JAN 1980

digital

MADE IN USA



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                .REM %

                        IDENTIFICATION

                PRODUCT CODE:           AC-F621A-MC

                PRODUCT NAME:           CKKABA0 11/44 TRAPS

                DATE CREATED:           MARCH 1979

                MAINTAINER:             DIAGNOSTIC GROUP

                AUTHOR:                 CHUCK ROBINSON
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                                1.      ABSTRACT

                                        THIS IS A TEST OF ALL OPERATIONS AND INSTRUCTIONS THAT CAUSE
                                        TRAPS.  ALSO TESTED ARE TRAP OVERFLOW CONDITIONS,
                                        ODDITIES OF REGISTER 6, INTERRUPTS , THE RESET AND WAIT INSTRUCTIONS.

                                2.      REQUIREMENTS

                                2.1     EQUIPMENT

                                        11/44 STANDARD COMPUTER

                                2.2     STORAGE

                                        2.2.1 PROGRAM STORAGE - THE ROUTINE USES MEMORY
                                              FROM 0000 TO 17600.

                                3.      LOADING PROCEDURE

                                3.1     METHOD

                                        PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.

                                4.      STARTING PROCEDURE


                                        THE PROGRAM STARTS  AT 200.

                                        IF IT IS DESIRED TO RESET THE PASS COUNT BACK TO
                                        ZERO ; THEN START THIS PROGRAM AT LOCATION 210

                                4.2     PROGRAM AND/OR OPERATOR ACTION

                                        LOAD PROGRAM INTO MEMORY. (BOTTOM 4K)
                                        LOAD ADDRESS.
                                        START.
                                        THE PROGRAM WILL LOOP.
                                        IT WILL PRINT ''CKKABA0 11/44 TRAPS'' AFTER THE FIRST ITERATION
                                        AND THEN PRINTS IT EVERY 15 TIMES(APROXIMATELY EVERY 15 SECONDS)
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                                5.      OPERATION


                                5.2     SUBROUTINE ABSTRACTS

                                        5.2.1 BEGIN AT 200

                                        5.2.2  SCOPE
                                               -----
                                               IF A SCOPE LOOP IS NEEDED INSERT A BRANCH AS THE
                                               COMMENT TO THE HALT EXPLAINS.


                                        5.2.3   TRAPCATCHER
                                                -----------

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

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

                                                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
                                                WHERE THE PROGRAM WAS. WHEN THE INTERRUPT OR
                                                TRAP OCCURRED; MEMORY AS SPECIFIED BY R6 CONTAINS THE
                                                PC OF THE INSTRUCTION FOLLOWING THE INSTRUCTION WHERE THE
                                                TRAP OCCURRED.
                                                THE CONTENTS OF LOCATION '$TESTN'(304) CONTAINS
                                                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.
                                        NOTE:IF A SCOPE LOOP IS NEEDED
                                       THE COMMENT SECTION OF THE HALT EXPLAINS
                                        HOW TO UTILIZE THIS LOOP.
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                                6.      ERRORS

                                6.1     ALL ERRORS WILL CAUSE A HALT.

                                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 SEQUENCIAL INCREMENT AND COMPARE COUNT.

                                        EXAMPLE

                                TSTA:   INC     @#$TSTNM        ;INCREMENT THE TEST NUMBER
                                        CMP     #A,@#$TSTNM     ;COMPARE FOR THE RIGHT TEST
                                        BNE     TSTA+1-12       ;IF NOT CORRECT BRACNH TO A HALT
                                        ----
                                        CODE


                                        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

                                        NONE

                                7.2     OPERATIONAL RESTRICTION

                                        NONE
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8. MISCELLANEOUS

8.1 EXECUTION TIME

2ST PASS APPROX. 2 SEC., THEREAFTER EVERY 15 SEC

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 IS THAT ALL RESERVED INSTRUCTIONS
WILL TRAP. VERIFICATION OF THE "TRT" 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.
THE RTI AND RTT INSTRUCTIONS ARE CHECKED. STACK OVERFLOW IS
ALSO CHECKED FOR ALL THE TRAP INSTRUCTIONS.
SPECIAL CHECKS ARE MADE TO SEE IF BUS
ERROR TRAPS OCCUR ON NON-EXISTENT MEMORY.PIRQ TRAPS ARE CHECKED AT ALL LEVELS

10.0 RUNNING UNDER APT

THE EXECUTION TIMES PROVIDED IN THE APT SCRIPT THAT FOLLOWS
ARE FOR EXECUTION WITH A 11/44 PROCESSOR, CACHE,
16K CORE MEMORY, AND 300 BAUD.
THE FOLLOWING IS A PROGRAM LOAD FILE USED BY APT:

1. E TABLE 'A' IS USED FOR APT DUMP MODE.

2. E TABLE 'B' IS USED FOR APT QV AND RUN TIME MODES.
$ENVM=040 INDICATES THAT TYPEOUTS WILL BE SUPRESSED.

1ST PASS RUN TIME	LONGEST TEST TIME	ADDITIONAL RUN TIME
5	5	0

.....	E TABLES	.....
	A	B
E-MODE/S-MODE ($ENVM/$ENV)	000/000	040/001
SWITCH REGISTER 1 ($SWREG)	000000	000000
SWITCH REGISTER 2	000000	000000
CPU TYPE/OPTIONS	00/0000	00/0000

```
317
318
319                                     %
```

```
                        ;ALL INSTRUCTIONS THAT ARE RESERVED
                        ;SHOULD TRAP TO LOCATION 10, AND THE
                        ;PC THAT POINTS TO THE TRAPPING INSTRUCTION
                        ;SHOULD BE PLACED ON THE STACK


                        ;LISTING


                                .LIST ME
                                .NLIST MC,MD,CND
000000                          .ENABLE ABS
        000006                  SP=%6
        000006                  R6=%6
        000003                  TAB=%3
        000001                  LAST=%1
        000005                  FIRST=%5
        000002                  R2=%2
        000000                  HLT=HALT
        000003                  TRT=3
        000004                  RTRAP5=4                ;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
        177776                  STATUS=177776
        000010                  TRAPA=10
        000010                  RTRAP=10
        004700                  ILLA=004700
        000100                  ILLB=100
        177776                  CC=177776
        177766                  CPUERR=177766
        177413                  CERMSK=177413
        177776                  PSW=177776
                        .MCALL  .$APTHDR
                        .MCALL  .$APTBLS
                        .MCALL  .$ACT11
```

```
                                .=200
000200  000167  000416          JMP     BEGIN
                                .=210
000210  005037  000306          CLR     @#$PASS
000214  000167  000402          JMP     BEGIN
                                .=300
                        .SBTTL  ACT11 HOOKS

                        ;*****************************************************************************************
                        ;HOOKS REQUIRED BY ACT11
                                $SVPC=.                 ;SAVE PC
                                .=46
000046  017172                  $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                                .=52
000052  000000                  .WORD   0               ;;2)SET LOC.52 TO ZERO
                                .=$SVPC                 ;; RESTORE PC
                        .SBTTL  APT MAILBOX-ETABLE

                        ;*****************************************************************************************
                        .EVEN
000300                  $MAIL:                          ;;APT MAILBOX
000300  000000          $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
000302  000000          $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
000304  000000          $TESTN: .WORD   ATESTN          ;;TEST NUMBER
000306  000000          $PASS:  .WORD   APASS           ;;PASS COUNT
000310  000000          $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
000312  000000          $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
000314  000000          $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
000316  000000          $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
000320                  $ETABLE:                        ;;APT ENVIRONMENT TABLE
000320     000          $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
000321     000          $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
000322  000000          $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
000324  000000          $USWR:  .WORD   AUSWR           ;;USER SWITCHES
000326  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
000330                  $ETEND:
                        .MEXIT
                        .SBTTL  APT PARAMETER BLOCK

                        ;*****************************************************************************************
                        ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                        ;*****************************************************************************************
                                .$X=.   ;;SAVE CURRENT LOCATION
                                .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                  200     ;;FOR APT START UP
                                .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  000330                  $APTHDR ;;POINT TO APT HEADER BLOCK
                                .=.$X   ;;RESET LOCATION COUNTER
                        ;*****************************************************************************************
                        ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                        ;INTERFACE SPEC.
```

```
        000330                          $APTHD:
        000330  000000                 $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
        000332  000300                 $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
        000334  000005                 $TSTM:  .WORD   5       ;;RUN TIM OF LONGEST TEST
        000336  000005                 $PASTM: .WORD   5       ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
        000340  000000                 $UNITM: .WORD   0       ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
        000342  000014                         .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
    447         000304                 $TSTNM=$TESTN
    448         000302                 $ERROR=$FATAL
    449
    450         000500                         .=500
    451 000500  000000                 BUFF:   0
    452 000502  000000                 RCPUER: .WORD 0
    453 000504  177572                 SR0:    177572
    454 000506  177573                 SR0H:   177573
    455 000510  177574                 SR1:    177574
    456 000512  177576                 SR2:    177576
    457 000514  000250                 KTVEC:  250
    458 000516  000252                 KTSTA:  252
    459 000520                         ADRTAB:
    460 000520  177600                 UPDR0:  177600          ;USER PAGE DESCRIPTOR REGISTERS
    461 000522  177602                 UPDR1:  177602
    462 000524  177604                 UPDR2:  177604
    463 000526  177606                 UPDR3:  177606
    464 000530  177610                 UPDR4:  177610
    465 000532  177612                 UPDR5:  177612
    466 000534  177614                 UPDR6:  177614
    467 000536  177616                 UPDR7:  177616
    468                                 ;
    469 000540  177640                 UPAR0:  177640          ;USER PAGE ADDRESS REGISTERS
    470 000542  177642                 UPAR1:  177642
    471 000544  177644                 UPAR2:  177644
    472 000546  177646                 UPAR3:  177646
    473 000550  177650                 UPAR4:  177650
    474 000552  177652                 UPAR5:  177652
    475 000554  177654                 UPAR6:  177654
    476 000556  177656                 UPAR7:  177656
    477                                 ;
    478 000560  172300                 KPDR0:  172300          ;KERNEL PAGE DESCRIPTOR REGISTERS
    479 000562  172302                 KPDR1:  172302
    480 000564  172304                 KPDR2:  172304
    481 000566  172306                 KPDR3:  172306
    482 000570  172310                 KPDR4:  172310
    483 000572  172312                 KPDR5:  172312
    484 000574  172314                 KPDR6:  172314
    485 000576  172316                 KPDR7:  172316
    486                                 ;
    487 000600  172340                 KPAR0:  172340          ;KERNEL PAGE ADDRESS REGISTERS
    488 000602  172342                 KPAR1:  172342
    489 000604  172344                 KPAR2:  172344
    490 000606  172346                 KPAR3:  172346
    491 000610  172350                 KPAR4:  172350
    492 000612  172352                 KPAR5:  172352
    493 000614  172354                 KPAR6:  172354
    494 000616  172356                 KPAR7:  172356
    495 000620  000616                 ADREND: .-2
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APT PARAMETER BLOCK

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496
497
498
```

```
                                                ;SET UP SACK BUFF
                                                ;CLEAR THE ITERATION COUNTER
                                                ;SET UP THE POWER DOWN VECTOR
                                                ;SET UP POWER DOWN PRIORITY
                                                ;SET UP TRAP VECTORS 4 & 6.
                                                ;SPECIAL CASE OF ODD;.EVEN .BYTE AND REGISTER 6
                                                ;*****************************************************************************
                                                ;TEST 1 TEST AUTO INC AND DEC OF R6 FOR WORD AND BYTES
                                                ;*****************************************************************************
                                                ;UPDATE TEST NUMBER
                                                ;SEQUENCE ERROR?
                                                ;SIX SHOULD INCREMENT BY TWO
                                                ;MOVE TO MAILBOX #  *******  1  *******
                                                ;SET MSGTYP TO FATAL ERROR
                                                ;R6 DID NOT AUTO INCREMENT BY TWO
                                                ; TO SCOPE REPLACE HALT W/ 240
                                                ; AND REPLACE NEXT INST W/ 764
                                                ;SHOULD DECREMENT BY TWO
                                                ;MOVE TO MAILBOX #  *******  2  *******
                                                ;SET MSGTYP TO FATAL ERROR
```

```
        001060  000000                          HALT                    ;R6 DID NOT AUTO DECREMENT BY 2
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 750
    545
    546 001062  005006                  BR2:    CLR     %6
    547 001064  112626                          MOVB    (6)+,(6)+       ;DOUBLES AUTO INCREMENT OF R6
    548 001066  020627  000004                  CMP     %6,#4
    549 001072  001405                          BEQ     BR3
        001074  012737  000003  000302          MOV     #3,@#$FATAL     ;MOVE TO MAILBOX #  *******  3  *******
        001102  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        001104  000000                          HALT                    ;WRONG AUTO INCREMENT OF R6
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 736
    550
    551 001106  005006                  BR3:    CLR     %6
    552 001110  005004                          CLR     %4
    553 001112  122624                          CMPB    (6)+,(4)+       ;TEST INCREMENT OF R6
    554 001114  020627  000002                  CMP     %6,#2
    555 001120  001405                          BEQ     BR4
        001122  012737  000004  000302          MOV     #4,@#$FATAL     ;MOVE TO MAILBOX #  *******  4  *******
        001130  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        001132  000000                          HALT                    ;WRONG INCREMENT OF R6
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 723
    556
    557 001134  005006                  BR4:    CLR     %6
    558 001136  005004                          CLR     %4
    559 001140  122426                          CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
    560 001142  020627  000002                  CMP     %6,#2
    561 001146  001405                          BEQ     BR5
        001150  012737  000005  000302          MOV     #5,@#$FATAL     ;MOVE TO MAILBOX #  *******  5  *******
        001156  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        001160  000000                          HALT                    ;WRONG INCREMENT OF R6
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 710
    562
    563 001162  005006                  BR5:    CLR     %6
    564 001164  005004                          CLR     %4
    565 001166  122624                          CMPB    (6)+,(4)+       ;TEST INCREMENT OF R4
    566 001170  020427  000001                  CMP     %4,#1
    567 001174  001405                          BEQ     BR6
        001176  012737  000006  000302          MOV     #6,@#$FATAL     ;MOVE TO MAILBOX #  *******  6  *******
        001204  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        001206  000000                          HALT                    ;WRONG INCREMENT OF R4
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 675
    568 001210  005006                  BR6:    CLR     %6
    569 001212  005004                          CLR     %4
    570 001214  122426                          CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
    571 001216  020627  000002                  CMP     %6,#2
    572 001222  001405                          BEQ     BR7
        001224  012737  000007  000302          MOV     #7,@#$FATAL     ;MOVE TO MAILBOX #  *******  7  *******
        001232  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        001234  000000                          HALT                    ;WRONG INCREMENT OF R6
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 662
    573
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574 001236 005006                BR7:    CLR     %6
575 001240 005004                        CLR     %4
576 001242 122426                        CMPB    (4)+,(6)+       ;TEST INCREMENT OF R4
577 001244 020427 000001                 CMP     %4,#1
578 001250 001405                        BEQ     BR10
    001252 012737 000010 000302          MOV     #10,@#$FATAL    ;MOVE TO MAILBOX #  *******  10  *******
    001260 005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    001262 000000                        HALT                    ;WRONG INCREMENT OF R4
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 647
579
580 001264 012706 001000         BR10:   MOV     #1000,%6
581 001270 124627 000000                 CMPB    -(6),#HERE      ;TEST DECREMENT OF R6
582 001274 022706 000776                 CMP     #776,%6
583 001300 001405                        BEQ     TST2
    001302 012737 000011 000302          MOV     #11,@#$FATAL    ;MOVE TO MAILBOX #  *******  11  *******
    001310 005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    001312 000000                        HALT                    ;WRONG DECREMENT OF R6,OR WRONG $TSTNM
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 633
584                                      .SBTTL TEST TRANSFER OF .BYTE USING R6
585                              ;*****************************************************************************
                                 ;TEST 2 TEST TRANSFER OF .BYTE USING R6
                                 ;*****************************************************************************
    001314 005237 000304         TST2:   INC     @#$TESTN        ;UPDATE TEST NUMBER
    001320 022737 000002 000304          CMP     #2,@#$TESTN     ;SEQUENCE ERROR?
    001326 001137                        BNE     TST3-12 ;BR TO ERROR HALT ON SEQ ERROR
586 001330 012767 123456 177416          MOV     #123456,K5
587 001336 012767 050505 177400          MOV     #050505,K1
588 001344 012705 000744                 MOV     #K1,%5          ;%5=(050505)K1
589 001350 012706 000754                 MOV     #K5,%6          ;%6=(123456)K5
590 001354 112625                        MOVB    (6)+,(5)+       ;LOW .BYTE OF R6 TO R5
591 001356 022767 050456 177360          CMP     #050456,K1
592 001364 001405                        BEQ     BR11
    001366 012737 000012 000302          MOV     #12,@#$FATAL    ;MOVE TO MAILBOX #  *******  12  *******
    001374 005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    001376 000000                        HALT                    ;FALSE TRANSFER OF .BYTE
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 753
593
594 001400 012767 123456 177346  BR11:  MOV     #123456,K5
595 001406 012767 050505 177330          MOV     #050505,K1
596 001414 012705 000744                 MOV     #K1,%5          ;%5(050505)K1
597 001420 012706 000756                 MOV     #K6,%6          ;%6(123456)K5
598 001424 114625                        MOVB    -(6),(5)+       ;LOW .BYTE OF R6 TO R5 (DECREMENT)
599 001426 026727 177312 050456          CMP     K1,#050456
600 001434 001405                        BEQ     BR12
    001436 012737 000013 000302          MOV     #13,@#$FATAL    ;MOVE TO MAILBOX #  *******  13  *******
    001444 005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    001446 000000                        HALT                    ;FALSE R6 .BYTE TRANSFER
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 727
601
602 001450 012767 123456 177266  BR12:  MOV     #123456,K1
603 001456 012767 050505 177270          MOV     #050505,K5
604 001464 012705 000744                 MOV     #K1,%5          ;(123456)
605 001470 012706 000754                 MOV     #K5,%6          ;(050505)
```

```
                                                MOVB    (5)+,(6)+       ;LOW OF R5 TO LOW OF R6
                                                CMP     #050456,K5
                                                BEQ     BR13
                                                MOV     #14,@#$FATAL    ;MOVE TO MAILBOX #  *******  14  *******
                                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                                HALT                    ;FALSE R6 .BYTE TRANSFER
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 703

                                        BR13:   MOV     #123456,K1
                                                MOV     #050505,K5
                                                MOV     #K1+1,%5        ;123456
                                                MOV     #K5,%6          ;050505
                                                MOVB    (5)+,(6)+       ;HIGH OF R5 TO LOW OF R6
                                                CMP     K5,#050647
                                                BEQ     BR14
                                                MOV     #15,@#$FATAL    ;MOVE TO MAILBOX #  *******  15  *******
                                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                                HALT                    ;FALSE R6 .BYTE TRANSFER
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 657

                                        BR14:   MOV     #123456,K1
                                                MOV     #050505,K5
                                                MOV     #K1+1,%5        ;R5-123456-ODD ADDRESS
                                                MOV     #K5,%6          ;R6-050505--.EVEN ADDRESS
                                                MOVB    (6)+,(5)+       ;LOW OF R6 TO HIGH OF R5
                                                CMP     #042456,K1
                                                BEQ     TST3
                                                MOV     #16,@#$FATAL    ;MOVE TO MAILBOX #  *******  16  *******
                                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                                HALT                    ;FAILED LOW OF 6 TO HIGH OF 5,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 633

                                                .SBTTL TEST SEQ ODD-EVEN ADDRESS
                                        ;***************************************************************************
                                        ;TEST 3 TEST BYTE OPERATION WITH SEQ ODD-EVEN ADDRESS
                                        ;***************************************************************************
                                        TST3:   INC     @#$TESTN        ;UPDATE TEST NUMBER
                                                CMP     #3,@#$TESTN     ;SEQUENCE ERROR?
                                                BNE     TST4-12 ;BR TO ERROR HALT ON SEQ ERROR
                                                CMPB    K7,K7+1         ;SAME .WORD LOW TO HIGH
                                                BEQ     BR15
                                                MOV     #17,@#$FATAL    ;MOVE TO MAILBOX #  *******  17  *******
                                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                                HALT                    ;SHOULD COMPARE LOW TO HIGH
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 766

                                        BR15:   CMPB    K7+1,K7         ;COMPARE ODD TO .EVEN SAME .WORD
                                                BEQ     BR16
                                                MOV     #20,@#$FATAL    ;MOVE TO MAILBOX #  *******  20  *******
                                                INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                                HALT                    ;ODD TO .EVEN .BYTE FAILURE
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 755
```

```
    633 001720  126767  177037  177032  BR16:   CMPB    K10+1,K7        ;SEQUENTIAL .BYTES
    634 001726  001405                  BEQ     BR17
        001730  012737  000021  000302          MOV     #21,@#$FATAL    ;MOVE TO MAILBOX #  *******  21  *******
        001736  005212                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
        001740  000000                  HALT                            ;ODD TO .EVEN FAILED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 744
    635
    636 001742  126767  177014  177006  BR17:   CMPB    K10,K6
    637 001750  001405                  BEQ     BR20
        001752  012737  000022  000302          MOV     #22,@#$FATAL    ;MOVE TO MAILBOX #  *******  22  *******
        001760  005212                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
        001762  000000                  HALT                            ;.EVEN TO EVEN FAILED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 733
    638 001764  126767  176771  176771  BR20:   CMPB    K7+1,K10+1
    639 001772  001405                  BEQ     BR21
        001774  012737  000023  000302          MOV     #23,@#$FATAL    ;MOVE TO MAILBOX #  *******  23  *******
        002002  005212                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
        002004  000000                  HALT                            ;ODD TO ODD FAILED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 722
    640
    641 002006  126767  176750  176747  BR21:   CMPB    K10,K10+1
    642 002014  001005                  BNE     BR22
        002016  012737  000024  000302          MOV     #24,@#$FATAL    ;MOVE TO MAILBOX #  *******  24  *******
        002024  005212                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
        002026  000000                  HALT                            ;LOW TO HIGH IN SAME .WORD FAILED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 711
    643
    644 002030  126767  176727  176725  BR22:   CMPB    K10+1,K10+1
    645 002036  001405                  BEQ     BR23
        002040  012737  000025  000302          MOV     #25,@#$FATAL    ;MOVE TO MAILBOX #  *******  25  *******
        002046  005212                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
        002050  000000                  HALT                            ;HIGH TO LOW IN SAME .WORD FAILED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 700
    646
    647 002052  126767  176704  176701  BR23:   CMPB    K10,K7+1
    648 002060  001005                  BNE     TST4
        002062  012737  000026  000302          MOV     #26,@#$FATAL    ;MOVE TO MAILBOX #  *******  26  *******
        002070  005212                  INC     (R2)                    ;SET MSGTYP TO FATAL ERROR
        002072  000000                  HALT                            ;.EVEN TO ODD FAILED,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 667
    649
    650                                 .SBTTL TEST THE CC BITS
    651
    652                             ;*******************************************************************************
                                    ;TEST 4 TEST THE CC BITS
                                    ;*******************************************************************************
        002074  005237  000304      TST4:   INC     @#$TESTN                ;UPDATE TEST NUMBER
        002100  022737  000004  000304      CMP     #4,@#$TESTN             ;SEQUENCE ERROR?
        002106  001062                      BNE     TST5-12 ;BR TO ERROR HALT ON SEQ ERROR
    653 002110  000277                      SCC                             ;SET STATUS
    654 002112  005067  175660              CLR     STATUS                  ;CLEAR STATUS
```

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    655 002116  103005                        BCC     BR33
        002120  012737  000027  000302        MOV     #27,@#$FATAL    ;MOVE TO MAILBOX #  *******  27  *******
        002126  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002130  000000                        HALT                    ;C NOT CLEAR
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 766
    656 002132                          BR33:
        002132  102005                        BVC     BR34
        002134  012737  000030  000302        MOV     #30,@#$FATAL    ;MOVE TO MAILBOX #  *******  30  *******
        002142  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002144  000000                        HALT                    ;V NOT CLEAR
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 760
    657 002146                          BR34:
        002146  001005                        BNE     BR35
        002150  012737  000031  000302        MOV     #31,@#$FATAL    ;MOVE TO MAILBOX #  *******  31  *******
        002156  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002160  000000                        HALT                    ;Z NOT CLEAR
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 752
    658 002162                          BR35:
        002162  100005                        BPL     BR36
        002164  012737  000032  000302        MOV     #32,@#$FATAL    ;MOVE TO MAILBOX #  *******  32  *******
        002172  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002174  000000                        HALT                    ;N NOT CLEAR
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 744
    659 002176  000257                  BR36: CCC                     ;CLEAR CONDITION CODES
    660 002200  052767  000017  175570        BIS     #17,STATUS      ;SET STATUS TO ONES
    661
    662 002206  103405                        BCS     BR37
        002210  012737  000033  000302        MOV     #33,@#$FATAL    ;MOVE TO MAILBOX #  *******  33  *******
        002216  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002220  000000                        HALT                    ;C NOT SET
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 732
    663 002222                          BR37:
        002222  102405                        BVS     BR40
        002224  012737  000034  000302        MOV     #34,@#$FATAL    ;MOVE TO MAILBOX #  *******  34  *******
        002232  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002234  000000                        HALT                    ;V NOT SET
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 724
    664 002236                          BR40:
        002236  001405                        BEQ     BR41
        002240  012737  000035  000302        MOV     #35,@#$FATAL    ;MOVE TO MAILBOX #  *******  35  *******
        002246  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002250  000000                        HALT                    ;Z NOT SET
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 716
    665 002252                          BR41:
        002252  100405                        BMI     TST5
        002254  012737  000036  000302        MOV     #36,@#$FATAL    ;MOVE TO MAILBOX #  *******  36  *******
        002262  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        002264  000000                        HALT                    ;N NOT SET,OR WRONG $TSTNM
                                                                       ; TO SCOPE REPLACE HALT W/ 240
                                                                       ; AND REPLACE NEXT INST W/ 710
```

```
                                ;*****************************************************************************************
                                ;TEST 5 TEST THAT A TRAP OCCURS ON A RESERVED INS
                                ;*****************************************************************************************
002266  005237  000304          TST5:   INC     @#$TESTN        ;UPDATE TEST NUMBER
002272  022737  000005  000304          CMP     #5,@#$TESTN     ;SEQUENCE ERROR?
002300  001006                        BNE     RETA            ;BR TO ERROR HALT ON SEQ ERROR
667 002302  012706  000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
668 002306  012767  002330  175474    MOV     #RETAH,RTRAP    ;RETURN LOCATION
669 002314  000010                    TRAPA                   ;RESERVED INSTRUCTION, SHOULD TRAP
670 002316                      RETA:
002316  012737  000037  000302        MOV     #37,@#$FATAL    ;MOVE TO MAILBOX #  *******  37  *******
002324  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002326  000000                        HALT                    ;RESERVE INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 764
671 002330                      RETAH:
672                                     .SBTTL TEST DEC OF STACK POINTER ON A TRAP OPERATION
673                             ;*****************************************************************************************
                                ;TEST 6 TEST DEC OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************************
002330  005237  000304          TST6:   INC     @#$TESTN        ;UPDATE TEST NUMBER
002334  022737  000006  000304          CMP     #6,@#$TESTN     ;SEQUENCE ERROR?
002342  001011                        BNE     TST7-12 ;BR TO ERROR HALT ON SEQ ERROR
674 002344  012706  000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
675 002350  012767  002360  175432    MOV     #RETB,RTRAP     ;RETURN POINTER
676 002356  000010                    TRAPA                   ;RESERVED INSTRUCTION
677 002360  020627  000474      RETB: CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
678 002364  001405                    BEQ     TST7
002366  012737  000040  000302        MOV     #40,@#$FATAL    ;MOVE TO MAILBOX #  *******  40  *******
002374  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002376  000000                        HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 761
679                                     .SBTTL TEST THAT PROPER PC IS SAVED
680                             ;*****************************************************************************************
                                ;TEST 7 TEST THAT PROPER P.C. IS SAVED
                                ;*****************************************************************************************
002400  005237  000304          TST7:   INC     @#$TESTN        ;UPDATE TEST NUMBER
002404  022737  000007  000304          CMP     #7,@#$TESTN     ;SEQUENCE ERROR?
002412  001012                        BNE     TST10-12        ;BR TO ERROR HALT ON SEQ ERROR
681 002414  012706  000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
682 002420  012767  002430  175362    MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
683 002426  000010              INSTC: TRAPA                   ;TRAP ON THIS INSTRUCTION
684 002430  022767  002430  176036 RETC: CMP     -#.,BUFF-4      ;CHECK FOR INCREMENTED P.C.
685 002436  001405                    BEQ     TST10
002440  012737  000041  000302        MOV     #41,@#$FATAL    ;MOVE TO MAILBOX #  *******  41  *******
002446  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
002450  000000                        HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 760
686                                     .SBTTL TEST THAT 'OLD' CC AND PRI ARE PLACED ON STACK
687                             ;*****************************************************************************************
                                ;TEST 10        TEST THAT 'OLD' CC AND PRI ARE PLACED ON STACK
                                ;*****************************************************************************************
002452  005237  000304          TST10:  INC     @#$TESTN        ;UPDATE TEST NUMBER
002456  022737  000010  000304          CMP     #10,@#$TESTN    ;SEQUENCE ERROR?
002464  001040                        BNE     TST11-12        ;BR TO ERROR HALT ON SEQ ERROR
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                     002466  012706  000500                  MOV     #BUFF,SP        ;SET UP
                     002472  012767  002510  175310          MOV     #RETD,RTRAP     ;SET UP
                     002500  005067  175272                  CLR     CC              ;CLEAR CC AND PRIORITY
                     002504  000257                          CCC
                     002506  000010                          TRAPA                   ;TRAP
                     002510  026727  175762  000000  RETD:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
                     002516  001405                          BEQ     1$
                     002520  012737  000042  000302          MOV     #42,@#$FATAL    ;MOVE TO MAILBOX #  *******  42  *******
                     002526  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                     002530  000000                          HALT                    ;INCORRECT STATUS
                                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                                     ; AND REPLACE NEXT INST W/ 755
                     002532  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
                     002536  012767  002556  175244          MOV     #RETE,RTRAP     ;SET UP
                     002544  012767  000357  175224          MOV     #357,CC         ;SET PRIORITY
                     002552  000277                          SCC                     ;SET CC
                     002554  000010                          TRAPA                   ;TRAP
                     002556  026727  175714  000357  RETE:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
                     002564  001405                          BEQ     TST11
                     002566  012737  000043  000302          MOV     #43,@#$FATAL    ;MOVE TO MAILBOX #  *******  43  *******
                     002574  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                     002576  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                                     ; AND REPLACE NEXT INST W/ 732

                                             .SBTTL TEST THAT 'NEW' STATUS IS CORRECT
                                     ;*************************************************************************
                                     ;TEST 11        TEST THAT 'NEW' STATUS IS CORRECT
                                     ;*************************************************************************
                     002600  005237  000304  TST11:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                     002604  022737  000011  000304          CMP     #11,@#$TESTN    ;SEQUENCE ERROR?
                     002612  001121                          BNE     STPP            ;BR TO ERROR HALT ON SEQ ERROR
                     002614  012706  000500                  MOV     #BUFF,SP
                     002620  012767  002634  175162          MOV     #RETF,RTRAP
                     002626  005067  175160                  CLR     RTRAP+2         ;CLEAR FUTURE PRIORITY AND CC
                     002632  000010                          TRAPA
                     002634                          RETF:                           ;TEST FOR "C" CLEARED
                     002634  100005                          BPL     1$
                     002636  012737  000044  000302          MOV     #44,@#$FATAL    ;MOVE TO MAILBOX #  *******  44  *******
                     002644  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                     002646  000000                          HALT                    ;N NOT CLEARED
                                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                                     ; AND REPLACE NEXT INST W/ 761
                     002650                          1$:
                     002650  001005                          BNE     2$
                     002652  012737  000045  000302          MOV     #45,@#$FATAL    ;MOVE TO MAILBOX #  *******  45  *******
                     002660  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                     002662  000000                          HALT                    ;Z NOT CLEARED
                                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                                     ; AND REPLACE NEXT INST W/ 753
                     002664                          2$:
                     002664  102005                          BVC     3$
                     002666  012737  000046  000302          MOV     #46,@#$FATAL    ;MOVE TO MAILBOX #  *******  46  *******
                     002674  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                     002676  000000                          HALT                    ;V NOT CLEARED
                                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                                     ; AND REPLACE NEXT INST W/ 745
                     002700                          3$:
```

```
                002700  103005                  BCC     4$
                002702  012737  000047  000302  MOV     #47,@#$FATAL    ;MOVE TO MAILBOX #  *******  47  *******
                002710  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                002712  000000                  HALT                    ;C NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 737
    713         002714  032767  000340  175054  4$:     BIT     #340,CC         ;TEST PRIORITY
    714         002722  001405                  BEQ     5$
                002724  012737  000050  000302  MOV     #50,@#$FATAL    ;MOVE TO MAILBOX #  *******  50  *******
                002732  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                002734  000000                  HALT                    ;PRIORITY NOT ZERO
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 726
    715         002736  012706  000500          5$:     MOV     #BUFF,SP
    716         002742  012767  002760  175040          MOV     #RETG,RTRAP
    717         002750  012767  000357  175034          MOV     #357,RTRAP+2    ;SET NEW ''CC'' AND PRIORITY
    718         002756  000010                  TRAPA                   ;TRAP HERE
    719         002760                  RETG:
    720         002760  100405                  BMI     1$
                002762  012737  000051  000302  MOV     #51,@#$FATAL    ;MOVE TO MAILBOX #  *******  51  *******
                002770  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                002772  000000                  HALT                    ;N NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 707
    721         002774                  1$:
                002774  001405                  BEQ     2$
                002776  012737  000052  000302  MOV     #52,@#$FATAL    ;MOVE TO MAILBOX #  *******  52  *******
                003004  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003006  000000                  HALT                    ;Z NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 701
    722         003010                  2$:
                003010  102405                  BVS     3$
                003012  012737  000053  000302  MOV     #53,@#$FATAL    ;MOVE TO MAILBOX #  *******  53  *******
                003020  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003022  000000                  HALT                    ;V NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 673
    723         003024                  3$:
                003024  103405                  BCS     4$
                003026  012737  000054  000302  MOV     #54,@#$FATAL    ;MOVE TO MAILBOX #  *******  54  *******
                003034  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003036  000000                  HALT                    ;C NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 665
    724         003040  016706  174732          4$:     MOV     CC,SP
    725         003044  042706  000017          BIC     #17,SP
    726         003050  022706  000340          CMP     #340,SP
    727         003054  001405                  BEQ     STPPA
                003056                  STPP:
                003056  012737  000055  000302  MOV     #55,@#$FATAL    ;MOVE TO MAILBOX #  *******  55  *******
                003064  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003066  000000                  HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 651
    728         003070  012767  000012  174712  STPPA:  MOV     #12,10
    729         003076  005067  174710          CLR     12
```

```
                                .SBTTL TEST THAT A TRAP OCCURS FOR A ''TRAP'' INSTRUCTION
                        ;*********************************************************************
                        ;TEST 12        TEST THAT A TRAP OCCURS FOR A ''TRAP'' INSTRUCTION
                        ;*********************************************************************
003102 005237 000304    TST12:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003106 022737 000012 000304     CMP     #12,@#$TESTN    ;SEQUENCE ERROR?
003114 001013                   BNE     TST13-12        ;BR TO ERROR HALT ON SEQ ERROR
003116 012767 000012 174664     MOV     #12,10
003124 005067 174662            CLR     12
003130 012706 000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
003134 012767 003156 174672     MOV     #RETA1,RTRAP1   ;RETURN LOCATION
003142 104400                   TRAP                    ;RESERVED INSTRUCTION, SHOULD TRAP
003144 012737 000056 000302     MOV     #56,@#$FATAL    ;MOVE TO MAILBOX #  *******  56  *******
003152 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003154 000000                   HALT                    ;TRAP DIDN'T TRAP,OR WRONG $TSTNM
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 757
003156                  RETA1:
                        ;*********************************************************************
                        ;TEST 13        TEST DEC OF STACK POINTER ON A TRAP OPERATION
                        ;*********************************************************************
003156 005237 000304    TST13:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003162 022737 000013 000304     CMP     #13,@#$TESTN    ;SEQUENCE ERROR?
003170 001011                   BNE     TST14-12        ;BR TO ERROR HALT ON SEQ ERROR
003172 012706 000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
003176 012767 003206 174630     MOV     #RETB1,RTRAP1   ;RETURN POINTER
003204 104400                   TRAP                    ;RESERVED INSTRUCTION
003206 020627 000474    RETB1:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
003212 001405                   BEQ     TST14
003214 012737 000057 000302     MOV     #57,@#$FATAL    ;MOVE TO MAILBOX #  *******  57  *******
003222 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003224 000000                   HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 761
                                .SBTTL TEST THAT PROPER P.C IS SAVED
                        ;*********************************************************************
                        ;TEST 14        TEST THAT PROPER P.C. IS SAVED
                        ;*********************************************************************
003226 005237 000304    TST14:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003232 022737 000014 000304     CMP     #14,@#$TESTN    ;SEQUENCE ERROR?
003240 001012                   BNE     TST15-12        ;BR TO ERROR HALT ON SEQ ERROR
003242 012706 000500            MOV     #BUFF,SP        ;STACK POINTER SETUP
003246 012767 003256 174560     MOV     #RETC1,RTRAP1   ;RETURN FROM TRAP POINTER
003254 104400                   TRAP                    ;TRAP ON THIS INSTRUCTION
003256 022767 003256 175210 RETC1:  CMP     #.,BUFF-4   ;CHECK INCREMENTED P.C.
003264 001405                   BEQ     TST15
003266 012737 000060 000302     MOV     #60,@#$FATAL    ;MOVE TO MAILBOX #  *******  60  *******
003274 005212                   INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003276 000000                   HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 760
                                .SBTTL TEST THAT ''OLD'' CC AND PIR ARE PLACED ON THE STACK
                        ;*********************************************************************
                        ;TEST 15        TEST THAT ''OLD'' CC AND PRI ARE PLACED ON STACK
                        ;*********************************************************************
003300 005237 000304    TST15:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003304 022737 000015 000304     CMP     #15,@#$TESTN    ;SEQUENCE ERROR?
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```
                003312  001037                          BNE     TST16-12        ;BR TO ERROR HALT ON SEQ ERROR
    754         003314  012706  000500                  MOV     #BUFF,SP        ;SET UP
    755         003320  012767  003336  174506          MOV     #RETD1,RTRAP1   ;SET UP
    756         003326  005067  174444                  CLR     CC              ;CLEAR CC AND PRIORITY
    757         003332  000257                          CCC
    758         003334  104400                          TRAP                    ;TRAP
    759         003336  026727  175134  000000  RETD1:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
    760         003344  001405                          BEQ     1$
                003346  012737  000061  000302          MOV     #61,@#$FATAL    ;MOVE TO MAILBOX #  *******  61  *******
                003354  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003356  000000                          HALT                    ;INCORRECT STATUS
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 755
    761         003360  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
    762         003364  012767  003402  174442          MOV     #RETE1,RTRAP1   ;SET UP
    763         003372  012767  000357  174376          MOV     #357,CC         ;SET PRIORITY
    764         003400  104400                          TRAP                    ;SET CC
    765         003402  026727  175070  000357  RETE1:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
    766         003410  001405                          BEQ     TST16
                003412  012737  000062  000302          MOV     #62,@#$FATAL    ;MOVE TO MAILBOX #  *******  62  *******
                003420  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003422  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 733
    767                                         .SBTTL TSET THAT 'NEW'' STATUS IS CORRECT
    768                                 ;***************************************************************************
                                        ;TEST 16        TEST THAT 'NEW'' STATUS IS CORRECT
                                        ;***************************************************************************
                003424  005237  000304  TST16:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                003430  022737  000016  000304          CMP     #16,@#$TESTN    ;SEQUENCE ERROR?
                003436  001121                          BNE     TST17-12        ;BR TO ERROR HALT ON SEQ ERROR
    769         003440  012706  000500                  MOV     #BUFF,SP
    770         003444  012767  003460  174362          MOV     #RETF1,RTRAP1
    771         003452  005067  174360                  CLR     RTRAP1+2        ;CLEAR FUTURE PRIORITY AND CC
    772         003456  104400                          TRAP
    773         003460                  RETF1:                                  ;TEST FOR ''C'' CLEARED
    774         003460  100005                          BPL     1$
                003462  012737  000063  000302          MOV     #63,@#$FATAL    ;MOVE TO MAILBOX #  *******  63  *******
                003470  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003472  000000                          HALT                    ;C NOT CLEARED
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 761
    775         003474                  1$:
                003474  001005                          BNE     2$
                003476  012737  000064  000302          MOV     #64,@#$FATAL    ;MOVE TO MAILBOX #  *******  64  *******
                003504  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003506  000000                          HALT                    ;Z NOT CLEARED
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 753
    776         003510                  2$:
                003510  102005                          BVC     3$
                003512  012737  000065  000302          MOV     #65,@#$FATAL    ;MOVE TO MAILBOX #  *******  65  *******
                003520  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003522  000000                          HALT                    ;V NOT CLEARED
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 745
    777         003524                  3$:
```

```
                003524  103005                          BCC     4$
                003526  012737  000066  000302          MOV     #66,@#$FATAL    ;MOVE TO MAILBOX #  *******  66  *******
                003534  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003536  000000                          HALT                    ;C NOT CLEARED
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 737
    778         003540  032767  000340  174230  4$:     BIT     #340,CC         ;TEST PRIORITY
    779         003546  001405                          BEQ     5$
                003550  012737  000067  000302          MOV     #67,@#$FATAL    ;MOVE TO MAILBOX #  *******  67  *******
                003556  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003560  000000                          HALT                    ;PRIORITY NOT ZERO
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 726
    780         003562  012706  000500          5$:     MOV     #BUFF,SP
    781         003566  012767  003604  174240          MOV     #RETG1,RTRAP1
    782         003574  012767  000357  174234          MOV     #357,RTRAP1+2   ;SET NEW ''CC'' AND PRIORITY
    783         003602  104400                          TRAP                    ;TRAP HERE
    784         003604                          RETG1:
    785         003604  100405                          BMI     1$
                003606  012737  000070  000302          MOV     #70,@#$FATAL    ;MOVE TO MAILBOX #  *******  70  *******
                003614  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003616  000000                          HALT                    ;N NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 707
    786         003620                          1$:
                003620  001405                          BEQ     2$
                003622  012737  000071  000302          MOV     #71,@#$FATAL    ;MOVE TO MAILBOX #  *******  71  *******
                003630  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003632  000000                          HALT                    ;Z NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 701
    787         003634                          2$:
                003634  102405                          BVS     3$
                003636  012737  000072  000302          MOV     #72,@#$FATAL    ;MOVE TO MAILBOX #  *******  72  *******
                003644  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003646  000000                          HALT                    ;V NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 673
    788         003650                          3$:
                003650  103405                          BCS     4$
                003652  012737  000073  000302          MOV     #73,@#$FATAL    ;MOVE TO MAILBOX #  *******  73  *******
                003660  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003662  000000                          HALT                    ;C NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 665
    789         003664  016706  174106          4$:     MOV     CC,SP
    790         003670  042706  000017                  BIC     #17,SP
    791         003674  022706  000340                  CMP     #340,SP
    792         003700  001405                          BEQ     TST17
                003702  012737  000074  000302          MOV     #74,@#$FATAL    ;MOVE TO MAILBOX #  *******  74  *******
                003710  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                003712  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 651
    793                                         .SBTTL TEST THAT ALL COMB ''TRAP'' WILL CAUSE A TRAP ON BR45
    794                                 ;*****************************************************************************
                                        ;TEST 17        TEST THAT ALL COMB  ''TRAP'' WILL CAUSE A TRAP
```

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                                ;*****************************************************************************************
003714  005237  000304          TST17:  INC     @#$TESTN        ;UPDATE TEST NUMBER
003720  022737  000017  000304          CMP     #17,@#$TESTN    ;SEQUENCE ERROR?
003726  001011                        BNE     BR45            ;BR TO ERROR HALT ON SEQ ERROR
795 003730  012767  104400  000012    MOV     #TRAP,RB1       ;INITIALIZE BASE TRAP INSTRUCTION
796 003736  012767  003764  174070    MOV     #RA1,34         ;RETURN FROM TRAP TO RA1
797 003744  012706  000500        RC1:    MOV     #BUFF,SP        ;SET UP STACK POINTER
798 003750  104400                RB1:    TRAP                    ;TRAP INST WILL BE MODIFIED TO TRAP+377
799 003752                        BR45:
003752  012737  000075  000302          MOV     #75,@#$FATAL    ;MOVE TO MAILBOX #  *******  75  *******
003760  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
003762  000000                        HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 761
800 003764  005267  177760        RA1:    INC     RB1             ;INCREMENT TRAP INSTRUCTION
801 003770  022767  104777  177752      CMP     #104777,RB1     ;TRAP+377 TO UPPER LIMIT
802 003776  103362                      BHIS    RC1             ;HAVE WE TESTED ALL
803 004000  012767  000036  174026      MOV     #36,34
804 004006  005067  174024              CLR     36
805                             ;*****************************************************************************************
                                ;TEST 20        TEST THAT A TRAP OCCURES ON AN ''IOT'' INSTRUCTION
                                ;*****************************************************************************************
004012  005237  000304          TST20:  INC     @#$TESTN        ;UPDATE TEST NUMBER
004016  022737  000020  000304          CMP     #20,@#$TESTN    ;SEQUENCE ERROR?
004024  001006                        BNE     TST21-12        ;BR TO ERROR HALT ON SEQ ERROR
806 004026  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
807 004032  012767  004054  173760      MOV     #RETA2,RTRAP2   ;RETURN LOCATION
808 004040  000004                      IOT                     ;RESERVE INSTRUCTION, SHOULD TRAP
809 004042  012737  000076  000302      MOV     #76,@#$FATAL    ;MOVE TO MAILBOX #  *******  76  *******
004050  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
004052  000000                          HALT                    ;IOT DIDN'T TRAP,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 764
810 004054                      RETA2:
811                             ;*****************************************************************************************
                                ;TEST 21        TEST DEC OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************************
004054  005237  000304          TST21:  INC     @#$TESTN        ;UPDATE TEST NUMBER
004060  022737  000021  000304          CMP     #21,@#$TESTN    ;SEQUENCE ERROR?
004066  001011                        BNE     TST22-12        ;BR TO ERROR HALT ON SEQ ERROR
812 004070  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
813 004074  012767  004104  173716      MOV     #RETB2,RTRAP2   ;RETURN POINTER
814 004102  000004                      IOT                     ;RESERVED INSTRUCTION
815 004104  020627  000474      RETB2:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
816 004110  001405                      BEQ     TST22
004112  012737  000077  000302          MOV     #77,@#$FATAL    ;MOVE TO MAILBOX #  *******  77  *******
004120  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
004122  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 761
817                             ;*****************************************************************************************
                                ;TEST 22        TEST THAT PROPER P.C. IS SAVED
                                ;*****************************************************************************************
004124  005237  000304          TST22:  INC     @#$TESTN        ;UPDATE TEST NUMBER
004130  022737  000022  000304          CMP     #22,@#$TESTN    ;SEQUENCE ERROR?
004136  001012                        BNE     TST23-12        ;BR TO ERROR HALT ON SEQ ERROR
818 004140  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
```

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819 004144  012767  004154  173646          MOV     #RETC2,RTRAP2   ;RETURN FROM TRAP POINTER
820 004152  000004                          IOT                     ;TRAP ON THIS INSTRUCTION
821 004154  022767  004154  174312  RETC2:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
822 004162  001405                          BEQ     TST23
    004164  012737  000100  000302          MOV     #100,@#$FATAL   ;MOVE TO MAILBOX #  *******  100  *******
    004172  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    004174  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 760
823                             ;*******************************************************************************
                                ;TEST 23        TEST THAT 'OLD' CC AND PRI ARE PLACED ON STACK
                                ;*******************************************************************************
    004176  005237  000304      TST23:  INC     @#$TESTN        ;UPDATE TEST NUMBER
    004202  022737  000023  000304          CMP     #23,@#$TESTN    ;SEQUENCE ERROR?
    004210  001040                          BNE     TST24-12        ;BR TO ERROR HALT ON SEQ ERROR
824 004212  012706  000500                  MOV     #BUFF,SP        ;SET UP
825 004216  012767  004234  173574          MOV     #RETD2,RTRAP2   ;SET UP
826 004224  005067  173546                  CLR     CC              ;CLEAR CC AND PRIORITY
827 004230  000257                          CCC
828 004232  000004                          IOT                     ;TRAP
829 004234  026727  174236  000000  RETD2:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
830 004242  001405                          BEQ     1$
    004244  012737  000101  000302          MOV     #101,@#$FATAL   ;MOVE TO MAILBOX #  *******  101  *******
    004252  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    004254  000000                          HALT                    ;INCORRECT STATUS
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 755
831 004256  012706  000500      1$:     MOV     #BUFF,SP        ;SET UP
832 004262  012767  004302  173530          MOV     #RETE2,RTRAP2   ;SET UP
833 004270  012767  000357  173500          MOV     #357,CC         ;SET PRIORITY
834 004276  000277                          SCC                     ;SET CC
835 004300  000004                          IOT                     ;TRAP
836 004302  026727  174170  000357  RETE2:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
837 004310  001405                          BEQ     TST24
    004312  012737  000102  000302          MOV     #102,@#$FATAL   ;MOVE TO MAILBOX #  *******  102  *******
    004320  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    004322  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 732
838                             ;*******************************************************************************
                                ;TEST 24        TEST THAT 'NEW' STATUS IS CORRECT
                                ;*******************************************************************************
    004324  005237  000304      TST24:  INC     @#$TESTN        ;UPDATE TEST NUMBER
    004330  022737  000024  000304          CMP     #24,@#$TESTN    ;SEQUENCE ERROR?
    004336  001121                          BNE     BR46            ;BR TO ERROR HALT ON SEQ ERROR
839 004340  012706  000500                  MOV     #BUFF,SP
840 004344  012767  004360  173446          MOV     #RETF2,RTRAP2
841 004352  005067  173444                  CLR     RTRAP2+2        ;CLEAR FUTURE PRIORITY AND CC
842 004356  000004                          IOT
843 004360                      RETF2:                              ;TEST FOR "C" CLEARED
844 004360  100005                          BPL     1$
    004362  012737  000103  000302          MOV     #103,@#$FATAL   ;MOVE TO MAILBOX #  *******  103  *******
    004370  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
    004372  000000                          HALT                    ;N NOT CLEARED
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 761
845 004374                      1$:
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                004374  001005                          BNE     2$
                004376  012737  000104  000302          MOV     #104,@#$FATAL   ;MOVE TO MAILBOX #  *******  104  *******
                004404  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004406  000000                          HALT                    ;Z NOT CLEARED
                                                                                ; TO SCOPE REPLACF HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 753
    846         004410                          2$:
                004410  102005                          BVC     3$
                004412  012737  000105  000302          MOV     #105,@#$FATAL   ;MOVE TO MAILBOX #  *******  105  *******
                004420  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004422  000000                          HALT                    ;V NOT CLEARED
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 745
    847         004424                          3$:
                004424  103005                          BCC     4$
                004426  012737  000106  000302          MOV     #106,@#$FATAL   ;MOVE TO MAILBOX #  *******  106  *******
                004434  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004436  000000                          HALT                    ;C NOT CLEARED
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 737
    848         004440  032767  000340  173330  4$:     BIT     #340,CC         ;TEST PRIORITY
    849         004446  001405                          BEQ     5$
                004450  012737  000107  000302          MOV     #107,@#$FATAL   ;MOVE TO MAILBOX #  *******  107  *******
                004456  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004460  000000                          HALT                    ;PRIORITY NOT ZERO
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 726
    850         004462  012706  000500          5$:     MOV     #BUFF,SP
    851         004466  012767  004504  173324          MOV     #RETG2,RTRAP2
    852         004474  012767  000357  173320          MOV     #357,RTRAP2+2   ;SET NEW "CC" AND PRIORITY
    853         004502  000004                          IOT                     ;TRAP HERE
    854         004504                          RETG2:
    855         004504  100405                          BMI     1$
                004506  012737  000110  000302          MOV     #110,@#$FATAL   ;MOVE TO MAILBOX #  *******  110  *******
                004514  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004516  000000                          HALT                    ;N NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 707
    856         004520                          1$:
                004520  001405                          BEQ     2$
                004522  012737  000111  000302          MOV     #111,@#$FATAL   ;MOVE TO MAILBOX #  *******  111  *******
                004530  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004532  000000                          HALT                    ;Z NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 701
    857         004534                          2$:
                004534  102405                          BVS     3$
                004536  012737  000112  000302          MOV     #112,@#$FATAL   ;MOVE TO MAILBOX #  *******  112  *******
                004544  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004546  000000                          HALT                    ;V NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 673
    858         004550                          3$:
                004550  103405                          BCS     4$
                004552  012737  000113  000302          MOV     #113,@#$FATAL   ;MOVE TO MAILBOX #  *******  113  *******
                004560  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                004562  000000                          HALT                    ;C NOT SET
```

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                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 665
 859 004564  016706  173206          4$:     MOV     CC,SP
 860 004570  042706  000017                  BIC     #17,SP
 861 004574  022706  000340                  CMP     #340,SP
 862 004600  001405                          BEQ     BR46A
     004602                          BR46:
     004602  012737  000114  000302          MOV     #114,@#$FATAL   ;MOVE TO MAILBOX #  *******  114  *******
     004610  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     004612  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 651
 863 004614  012767  000022  173176  BR46A: MOV     #22,20          ;.+2
 864 004622  005067  173174                  CLR     22              ;HALT
 865                                ;*********************************************************************************
                                    ;TEST 25        TEST THAT A TRAP OCCURS ON AN EMT  INS
                                    ;*********************************************************************************
     004626  005237  000304        TST25:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     004632  022737  000025  000304        CMP     #25,@#$TESTN    ;SEQUENCE ERROR?
     004640  001006                        BNE     TST26-12        ;BR TO ERROR HALT ON SEQ ERROR
 866 004642  012706  000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
 867 004646  012767  004670  173154        MOV     #RETA3,RTRAP3   ;RETURN LOCATION
 868 004654  104000                        EMT                     ;RESERVE INSTRUCTIOM, SHOULD TRAP
 869 004656  012737  000115  000302        MOV     #115,@#$FATAL   ;MOVE TO MAILBOX #  *******  115  *******
     004664  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     004666  000000                        HALT                    ;EMT DIDN'T TRAP,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 764
 870 004670                         RETA3:
 871                                ;*********************************************************************************
                                    ;TEST 26        TEST DEC OF STACK POINTER ON A TRAP OPER
                                    ;*********************************************************************************
     004670  005237  000304        TST26:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     004674  022737  000026  000304        CMP     #26,@#$TESTN    ;SEQUENCE ERROR?
     004702  001011                        BNE     TST27-12        ;BR TO ERROR HALT ON SEQ ERROR
 872 004704  012706  000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
 873 004710  012767  004720  173112        MOV     #RETB3,RTRAP3   ;RETURN POINTER
 874 004716  104000                        EMT                     ;RESERVED INSTRUCTION
 875 004720  020627  000474        RETB3:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
 876 004724  001405                        BEQ     TST27
     004726  012737  000116  000302        MOV     #116,@#$FATAL   ;MOVE TO MAILBOX #  *******  116  *******
     004734  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     004736  000000                        HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 761
 877                                ;*********************************************************************************
                                    ;TEST 27        TEST THAT PROPER P.C. IS SAVED
                                    ;*********************************************************************************
     004740  005237  000304        TST27:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     004744  022737  000027  000304        CMP     #27,@#$TESTN    ;SEQUENCE ERROR?
     004752  001012                        BNE     TST30-12        ;BR TO ERROR HALT ON SEQ ERROR
 878 004754  012706  000500                MOV     #BUFF,SP        ;STACK POINTER SETUP
 879 004760  012767  004770  173042        MOV     #RETC3,RTRAP3   ;RTURN FROM TRAP POINTER
 880 004766  104000                        EMT                     ;TRAP ON THIS INSTRICTION
 881 004770  022767  004770  173476  RETC3: CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
 882 004776  001405                        BEQ     TST30
     005000  012737  000117  000302        MOV     #117,@#$FATAL   ;MOVE TO MAILBOX #  *******  117  *******
```

```
                005006  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                005010  000000                  HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 760
    883                                 ;*******************************************************************************
                                        ;TEST 30        TEST THAT 'OLD' CC AND PRI ARE PLACED ON STACK
                                        ;*******************************************************************************
                005012  005237  000304  TST30:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                005016  022737  000030  000304  CMP     #30,@#$TESTN    ;SEQUENCE ERROR?
                005024  001040                  BNE     TST31-12        ;BR TO ERROR HALT ON SEQ ERROR
    884         005026  012706  000500          MOV     #BUFF,SP        ;SET UP
    885         005032  012767  005050  172770  MOV     #RETD3,RTRAP3   ;SET UP
    886         005040  005067  172732          CLR     CC              ;CLEAR CC AND PRIORITY
    887         005044  000257                  CCC
    888         005046  104000                  EMT                     ;TRAP
    889         005050  026727  173422  000000  RETD3:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
    890         005056  001405                  BEQ     1$
                005060  012737  000120  000302          MOV     #120,@#$FATAL   ;MOVE TO MAILBOX #  *******  120  *******
                005066  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                005070  000000                  HALT                    ;INCORRECT STATUS
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 755
    891         005072  012706  000500  1$:     MOV     #BUFF,SP        ;SET UP
    892         005076  012767  005116  172724          MOV     #RETE3,RTRAP3   ;SET UP
    893         005104  012767  000357  172664          MOV     #357,CC         ;SET PRIORITY
    894         005112  000277                  SCC                     ;SET CC
    895         005114  104000                  EMT                     ;TRAP
    896         005116  026727  173354  000357  RETE3:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
    897         005124  001405                  BEQ     TST31
                005126  012737  000121  000302          MOV     #121,@#$FATAL   ;MOVE TO MAILBOX #  *******  121  *******
                005134  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                005136  000000                  HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 732
    898                                 ;*******************************************************************************
                                        ;TEST 31        TEST THAT 'NEW' STATUS IS CORRECT
                                        ;*******************************************************************************
                005140  005237  000304  TST31:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                005144  022737  000031  000304  CMP     #31,@#$TESTN    ;SEQUENCE ERROR?
                005152  001117                  BNE     TST32-12        ;BR TO ERROR HALT ON SEQ ERROR
    899         005154  012706  000500          MOV     #BUFF,SP
    900         005160  012767  005174  172642          MOV     #RETF3,RTRAP3
    901         005166  005067  172640          CLR     RTRAP3+2        ;CLEAR FUTURE PRIORITY AND CC
    902         005172  104000                  EMT
    903         005174                  RETF3:                          ;TEST FOR "C" CLEARED
    904         005174  100005                  BPL     1$
                005176  012737  000122  000302          MOV     #122,@#$FATAL   ;MOVE TO MAILBOX #  *******  122  *******
                005204  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                005206  000000                  HALT                    ;C NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 761
    905         005210                  1$:
                005210  001005                  BNE     2$
                005212  012737  000123  000302          MOV     #123,@#$FATAL   ;MOVE TO MAILBOX #  *******  123  *******
                005220  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                005222  000000                  HALT                    ;Z NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
```

```
                                                                ; AND REPLACE NEXT INST W/ 753
    906 005224                                  2$:
        005224  102005                          BVC     3$
        005226  012737  000124  000302          MOV     #124,@#$FATAL   ;MOVE TO MAILBOX #  *******  124  *******
        005234  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005236  000000                          HALT                    ;V NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 745
    907 005240                                  3$:
        005240  103005                          BCC     4$
        005242  012737  000125  000302          MOV     #125,@#$FATAL   ;MOVE TO MAILBOX #  *******  125  *******
        005250  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005252  000000                          HALT                    ;C NOT CLEARED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 737
    908 005254  032767  000340  172514  4$:     BIT     #340,CC         ;TEST PRIORITY
    909 005262  001405                          BEQ     5$
        005264  012737  000126  000302          MOV     #126,@#$FATAL   ;MOVE TO MAILBOX #  *******  126  *******
        005272  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005274  000000                          HALT                    ;PRIORITY NOT ZERO
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 726
    910 005276  012706  000500          5$:     MOV     #BUFF,SP
    911 005302  012767  005320  172520          MOV     #RETG3,RTRAP3
    912 005310  012767  000357  172514          MOV     #357,RTRAP3+2   ;SET NEW ''CC'' AND PRIORITY
    913 005316  104000                          EMT                     ;TRAP HERE
    914 005320                                  RETG3:
    915 005320  100405                          BMI     1$
        005322  012737  000127  000302          MOV     #127,@#$FATAL   ;MOVE TO MAILBOX #  *******  127  *******
        005330  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005332  000000                          HALT                    ;N NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 707
    916 005334                                  1$:
        005334  001405                          BEQ     2$
        005336  012737  000130  000302          MOV     #130,@#$FATAL   ;MOVE TO MAILBOX #  *******  130  *******
        005344  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005346  000000                          HALT                    ;Z NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 701
    917 005350                                  2$:
        005350  102405                          BVS     3$
        005352  012737  000131  000302          MOV     #131,@#$FATAL   ;MOVE TO MAILBOX #  *******  131  *******
        005360  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005362  000000                          HALT                    ;V NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 673
    918 005364                                  3$:
        005364  103405                          BCS     4$
        005366  012737  000132  000302          MOV     #132,@#$FATAL   ;MOVE TO MAILBOX #  *******  132  *******
        005374  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        005376  000000                          HALT                    ;C NOT SET
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 665
    919 005400  000257                          CCC
    920 005402  022767  000340  172366          CMP     #340,CC
    921 005410  001405                          BEQ     TST32
```

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 005412  012737  000133  000302          MOV     #133,@#$FATAL   ;MOVE TO MAILBOX #  *******  133  *******
 005420  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 005422  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                  ; TO SCOPE REPLACE HALT W/ 240
                                                                  ; AND REPLACE NEXT INST W/ 653
922                             ;*****************************************************************************
                                ;TEST 32        TEST THAT ALL COMB  EMT WILL CAUSE A TRAP
                                ;*****************************************************************************
 005424  005237  000304         TST32:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 005430  022737  000032  000304          CMP     #32,@#$TESTN    ;SEQUENCE ERROR?
 005436  001011                         BNE     BR47            ;BR TO ERROR HALT ON SEQ ERROR
923 005440  012767  104000  000012      MOV     #EMT,RB         ;INITIALIZE BASE EMT INSTRUCTION
924 005446  012767  005474  172354      MOV     #RA,30          ;RETURN FROM TRAP TO RA
925 005454  012706  000500      RC:     MOV     #BUFF,SP        ;SET UP STACK POINTER
926 005460  104000              RB:     EMT                     ;TRAP INST. WILL BE MODIFIED TO EMT+377
927 005462                      BR47:
 005462  012737  000134  000302          MOV     #134,@#$FATAL   ;MOVE TO MAILBOX #  *******  134  *******
 005470  005212                          INC     (R2)            ;SET MSGTYP TU FATAL ERROR
 005472  000000                          HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
                                                                  ; TO SCOPE REPLACE HALT W/ 240
                                                                  ; AND REPLACE NEXT INST W/ 761
928 005474  005267  177760      RA:     INC     RB              ;INCREMENT TRAP INSTRUCTION
929 005500  022767  104377  177752      CMP     #104377,RB      ;EMT+377 TO EMT?
930 005506  103362                      BHIS    RC              ;HAVE WE TESTED ALL
931                                                             ;YES
932 005510  012767  000032  172312      MOV     #32,30          ;/.+
933 005516  005067  172310              CLR     32              ;HALT
934                             ;*****************************************************************************
                                ;TEST 33        TEST THAT A TRAP OCCURES ON AN 'TRACE-TRT'' INS
                                ;*****************************************************************************
 005522  005237  000304         TST33:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 005526  022737  000033  000304          CMP     #33,@#$TESTN    ;SEQUENCE ERROR?
 005534  001006                         BNE     TST34-12        ;BR TO ERROR HALT ON SEQ ERROR
935 005536  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
936 005542  012767  005564  172244      MOV     #RETA4,RTRAP4   ;RETURN LOCATION
937 005550  000003                      TRT                     ;RESERVED INSTRUCTION, SHOULD TRAP
938 005552  012737  000135  000302      MOV     #135,@#$FATAL   ;MOVE TO MAILBOX #  *******  135  *******
 005560  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 005562  000000                          HALT                    ;TRT DIDN'T TRAP,OR WRONG $TSTNM
                                                                  ; TO SCOPE REPLACE HALT W/ 240
                                                                  ; AND REPLACE NEXT INST W/ 764
939 005564                      RETA4:
940                             ;*****************************************************************************
                                ;TEST 34        TEST DEC OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************
 005564  005237  000304         TST34:  INC     @#$TESTN        ;UPDATE TEST NUMBER
 005570  022737  000034  000304          CMP     #34,@#$TESTN    ;SEQUENCE ERROR?
 005576  001011                         BNE     TST35-12        ;BR TO ERROR HALT ON SEQ ERROR
941 005600  012706  000500              MOV     #BUFF,SP        ;STACK POINTER SETUP
942 005604  012767  005614  172202      MOV     #RETB4,RTRAP4   ;RETURN POINTER
943 005612  000003                      TRT                     ;RESERVED INSTRUCTION
944 005614  020627  000474      RETB4:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
945 005620  001405                      BEQ     TST35
 005622  012737  000136  000302          MOV     #136,@#$FATAL   ;MOVE TO MAILBOX #  *******  136  *******
 005630  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
 005632  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                  ; TO SCOPE REPLACE HALT W/ 240
```

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                                                        ; AND REPLACE NEXT INST W/ 761
946                                     ;*************************************************************************************
                                        ;TEST 35        TEST THAT PROPER P.C. IS SAVED
                                        ;*************************************************************************************
     005634  005237  000304             TST35:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     005640  022737  000035  000304             CMP     #35,@#$TESTN    ;SEQUENCE ERROR?
     005646  001012                     BNE     TST36-12        ;BR TO ERROR HALT ON SEQ ERROR
947  005650  012706  000500             MOV     #BUFF,SP        ;STACK POINTER SETUP
948  005654  012767  005664  172132     MOV     #RETC4,RTRAP4   ;RETURN FROM TRAP POINTER
949  005662  000003                     TRT                     ;TRAP ON THIS INSTRUCTION
950  005664  022767  005664  172602 RETC4:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
951  005672  001405                     BEQ     TST36
     005674  012737  000137  000302     MOV     #137,@#$FATAL   ;MOVE TO MAILBOX #  *******  137  *******
     005702  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     005704  000000                     HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 760
952                                     ;*************************************************************************************
                                        ;TEST 36        TEST THAT 'OLD'' CC AND PRI ARE PLACED ON STACK
                                        ;*************************************************************************************
     005706  005237  000304             TST36:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     005712  022737  000036  000304             CMP     #36,@#$TESTN    ;SEQUENCE ERROR?
     005720  001040                     BNE     TST37-12        ;BR TO ERROR HALT ON SEQ ERROR
953  005722  012706  000500             MOV     #BUFF,SP        ;SET UP
954  005726  012767  005744  172060     MOV     #RETD4,RTRAP4   ;SET UP
955  005734  005067  172036             CLR     CC              ;CLEAR CC AND PRIORITY
956  005740  000257                     CCC
957  005742  000003                     TRT                     ;TRAP
958  005744  026727  172526  000000 RETD4:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
959                                                     ;TEST FOR ALL ZEROS
960  005752  001405                     BEQ     1$
     005754  012737  000140  000302     MOV     #140,@#$FATAL   ;MOVE TO MAILBOX #  *******  140  *******
     005762  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     005764  000000                     HALT                    ;INCORRECT STATUS
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 755
961  005766  012706  000500         1$:     MOV     #BUFF,SP        ;SET UP
962  005772  012767  006012  172014     MOV     #RETE4,RTRAP4   ;SET UP
963  006000  012767  000357  171770     MOV     #357,CC         ;SET PRIORITY
964  006006  000277                     SCC                     ;SET-SET CC
965  006010  000003                     TRT                     ;TRAP
966  006012  026727  172460  000357 RETE4:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
967  006020  001405                     BEQ     TST37
     006022  012737  000141  000302     MOV     #141,@#$FATAL   ;MOVE TO MAILBOX #  *******  141  *******
     006030  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     006032  000000                     HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                        ; AND REPLACE NEXT INST W/ 732
968                                     ;*************************************************************************************
                                        ;TEST 37        TEST THAT 'NEW'' STATUS IS CORRECT
                                        ;*************************************************************************************
     006034  005237  000304             TST37:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     006040  022737  000037  000304             CMP     #37,@#$TESTN    ;SEQUENCE ERROR?
     006046  001121                     BNE     BR51            ;BR TO ERROR HALT ON SEQ ERROR
969  006050  012706  000500             MOV     #BUFF,SP
970  006054  012767  006070  171732     MOV     #RETF4,RTRAP4
971  006062  005067  171730             CLR     RTRAP4+2        ;CLEAR FUTURE PRIORITY AND CC
```

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    972 006066  000003                        TRT
    973 006070                          RETF4:                      ;TEST FOR "C" CLEARED
    974 006070  100005                        BPL     1$
        006072  012737  000142  000302        MOV     #142,@#$FATAL ;MOVE TO MAILBOX #  *******  142  *******
        006100  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006102  000000                        HALT                  ;C NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 761
    975 006104                          1$:
        006104  001005                        BNE     2$
        006106  012737  000143  000302        MOV     #143,@#$FATAL ;MOVE TO MAILBOX #  *******  143  *******
        006114  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006116  000000                        HALT                  ;Z NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 753
    976 006120                          2$:
        006120  102005                        BVC     3$
        006122  012737  000144  000302        MOV     #144,@#$FATAL ;MOVE TO MAILBOX #  *******  144  *******
        006130  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006132  000000                        HALT                  ;V NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 745
    977 006134                          3$:
        006134  103005                        BCC     4$
        006136  012737  000145  000302        MOV     #145,@#$FATAL ;MOVE TO MAILBOX #  *******  145  *******
        006144  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006146  000000                        HALT                  ;C NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 737
    978 006150  032767  000340  171620  4$:  BIT     #340,CC       ;TEST PRIORITY
    979 006156  001405                        BEQ     5$
        006160  012737  000146  000302        MOV     #146,@#$FATAL ;MOVE TO MAILBOX #  *******  146  *******
        006166  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006170  000000                        HALT                  ;PRIORITY NOT ZERO
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 726
    980 006172  012706  000500          5$:  MOV     #BUFF,SP
    981 006176  012767  006214  171610        MOV     #RETG4,RTRAP4
    982 006204  012767  000357  171604        MOV     #357,RTRAP4+2 ;SET NEW "CC" AND PRIORITY
    983 006212  000003                        TRT                   ;TRAP HERE
    984 006214                          RETG4:
    985 006214  100405                        BMI     1$
        006216  012737  000147  000302        MOV     #147,@#$FATAL ;MOVE TO MAILBOX #  *******  147  *******
        006224  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006226  000000                        HALT                  ;N NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 707
    986 006230                          1$:
        006230  001405                        BEQ     2$
        006232  012737  000150  000302        MOV     #150,@#$FATAL ;MOVE TO MAILBOX #  *******  150  *******
        006240  005212                        INC     (R2)          ;SET MSGTYP TO FATAL ERROR
        006242  000000                        HALT                  ;Z NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 701
    987 006244                          2$:
        006244  102405                        BVS     3$
        006246  012737  000151  000302        MOV     #151,@#$FATAL ;MOVE TO MAILBOX #  *******  151  *******
```

```
                006254  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                006256  000000                          HALT                    ;V NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 673
    988         006260                          3$:
                006260  103405                          BCS     4$
                006262  012737  000152  000302          MOV     #152,@#$FATAL   ;MOVE TO MAILBOX #  *******  152  *******
                006270  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                006272  000000                          HALT                    ;C NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 665
    989         006274  016706  171476          4$:     MOV     CC,SP
    990         006300  042706  000017                  BIC     #17,SP
    991         006304  022706  000340                  CMP     #340,SP
    992         006310  001405                          BEQ     BR51A
                006312                          BR51:
                006312  012737  000153  000302          MOV     #153,@#$FATAL   ;MOVE TO MAILBOX #  *******  153  *******
                006320  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                006322  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 651
    993         006324  012767  000016  171462  BR51A:  MOV     #16,14
    994         006332  005067  171460                  CLR     16
    995
    996                                         ;PDP-11 ILLEGAL AND ADDRESS INSTRUCTION TEST
    997                                         ;ALL INSTRUCTIONS THAT ARE ILLEGAL
    998                                         ;SHOULD TRAP TO LOCATION 10, AND THE
    999                                         ;PC THAT POINTS TO THE TRAPPING INSTRUCTION
   1000                                         ;SHOULD BE PLACED ON THE STACK
   1001
   1002                                         ;*************************************************************************************
                                                ;TEST 40        TEST THAT A TRAP OCCURS ON AN ILLEGAL INS
                                                ;*************************************************************************************
                006336  005237  000304  TST40:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                006342  022737  000040  000304          CMP     #40,@#$TESTN    ;SEQUENCE ERROR?
                006350  001006                          BNE     TST41-12        ;BR TO ERROR HALT ON SEQ ERROR
   1003         006352  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
   1004         006356  012767  006400  171424          MOV     #RETA5,RTRAP    ;RETURN LOCATION
   1005         006364  000100                          JMP     %0              ;ILLEGAL INSTRUCTION, SHOULD TRAP
   1006         006366  012737  000154  000302          MOV     #154,@#$FATAL   ;MOVE TO MAILBOX #  *******  154  *******
                006374  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                006376  000000                          HALT                    ;ILLEGAL INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 764
   1007         006400                          RETA5:
   1008                                         ;*************************************************************************************
                                                ;TEST 41        TEST DEC OF STACK POINTER ON A TRAP OPERATION
                                                ;*************************************************************************************
                006400  005237  000304  TST41:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                006404  022737  000041  000304          CMP     #41,@#$TESTN    ;SEQUENCE ERROR?
                006412  001011                          BNE     TST42-12        ;BR TO ERROR HALT ON SEQ ERROR
   1009         006414  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
   1010         006420  012767  006430  171362          MOV     #RETB5,RTRAP    ;RETURN POINTER
   1011         006426  000100                          JMP     %0              ;RESERVED INSTRUCTION
   1012         006430  020627  000474          RETB5:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
   1013         006434  001405                          BEQ     TST42
                006436  012737  000155  000302          MOV     #155,@#$FATAL   ;MOVE TO MAILBOX #  *******  155  *******
```

```
        006444  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        006446  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 761
  1014                                  ;*****************************************************************************
                                        ;TEST 42        TEST THAT PROPER P.C. IS SAVED
                                        ;*****************************************************************************
        006450  005237  000304          TST42:  INC     @#$TESTN        ;UPDATE TEST NUMBER
        006454  022737  000042  000304          CMP     #42,@#$TESTN    ;SEQUENCE ERROR?
        006462  001012                          BNE     TST43-12        ;BR TO ERROR HALT ON SEQ ERROR
  1015  006464  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
  1016  006470  012767  006500  171312          MOV     #RETC5,RTRAP    ;RETURN FROM TRAP POINTER
  1017  006476  000100                          JMP     %0              ;TRAP ON THIS INSTRUCTION
  1018  006500  022767  006500  171766  RETC5:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
  1019  006506  001405                          BEQ     TST43
        006510  012737  000156  000302          MOV     #156,@#$FATAL   ;MOVE TO MAILBOX #  *******  156  *******
        006516  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        006520  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 760
  1020                                  ;*****************************************************************************
                                        ;TEST 43        TEST THAT 'OLD' CC AND PRI ARE PLACED ON STACK
                                        ;*****************************************************************************
        006522  005237  000304          TST43:  INC     @#$TESTN        ;UPDATE TEST NUMBER
        006526  022737  000043  000304          CMP     #43,@#$TESTN    ;SEQUENCE ERROR?
        006534  001040                          BNE     TST44-12        ;BR TO ERROR HALT ON SEQ ERROR
  1021  006536  012706  000500                  MOV     #BUFF,SP        ;SET UP
  1022  006542  012767  006560  171240          MOV     #RETD5,RTRAP    ;SET UP
  1023  006550  005067  171222                  CLR     CC              ;CLEAR CC AND PRIORITY
  1024  006554  000257                          CCC
  1025  006556  000100                          JMP     %0              ;TRAP
  1026  006560  026727  171712  000000  RETD5:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
  1027  006566  001405                          BEQ     1$
        006570  012737  000157  000302          MOV     #157,@#$FATAL   ;MOVE TO MAILBOX #  *******  157  *******
        006576  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        006600  000000                          HALT                    ;INCORRECT STATUS
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 755
  1028  006602  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
  1029  006606  012767  006626  171174          MOV     #RETE5,RTRAP    ;SET UP
  1030  006614  012767  000357  171154          MOV     #357,CC         ;SET PRIORITY
  1031  006622  000277                          SCC                     ;SET CC
  1032  006624  000100                          JMP     %0              ;TRAP
  1033  006626  026727  171644  000357  RETE5:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
  1034  006634  001405                          BEQ     TST44
        006636  012737  000160  000302          MOV     #160,@#$FATAL   ;MOVE TO MAILBOX #  *******  160  *******
        006644  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        006646  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 732
  1035                                  ;*****************************************************************************
                                        ;TEST 44        TEST THAT 'NEW' STATUS IS CORRECT
                                        ;*****************************************************************************
        006650  005237  000304          TST44:  INC     @#$TESTN        ;UPDATE TEST NUMBER
        006654  022737  000044  000304          CMP     #44,@#$TESTN    ;SEQUENCE ERROR?
        006662  001117                          BNE     TST45-12        ;BR TO ERROR HALT ON SEQ ERROR
  1036  006664  012706  000500                  MOV     #BUFF,SP
```

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1037 006670  012767  006704  171112          MOV     #RETF5,RTRAP
1038 006676  005067  171110                  CLR     RTRAP+2 ;CLEAR FUTURE PRIORITY AND CC
1039 006702  000100                          JMP     %0
1040 006704                          RETF5:                          ;TEST FOR "C" CLEARED
1041 006704  100005                          BPL     1$
     006706  012737  000161  000302          MOV     #161,@#$FATAL   ;MOVE TO MAILBOX #  *******  161  *******
     006714  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     006716  000000                          HALT                    ;C NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 761
1042 006720                          1$:
     006720  001005                          BNE     2$
     006722  012737  000162  000302          MOV     #162,@#$FATAL   ;MOVE TO MAILBOX #  *******  162  *******
     006730  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     006732  000000                          HALT                    ;Z NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 753
1043 006734                          2$:
     006734  102005                          BVC     3$
     006736  012737  000163  000302          MOV     #163,@#$FATAL   ;MOVE TO MAILBOX #  *******  163  *******
     006744  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     006746  000000                          HALT                    ;V NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 745
1044 006750                          3$:
     006750  103005                          BCC     4$
     006752  012737  000164  000302          MOV     #164,@#$FATAL   ;MOVE TO MAILBOX #  *******  164  *******
     006760  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     006762  000000                          HALT                    ;C NOT CLEARED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 737
1045 006764  032767  000357  171004  4$:     BIT     #357,CC         ;TEST PRIORITY
1046 006772  001405                          BEQ     5$
     006774  012737  000165  000302          MOV     #165,@#$FATAL   ;MOVE TO MAILBOX #  *******  165  *******
     007002  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007004  000000                          HALT                    ;PRIORITY NOT ZERO
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 726
1047 007006  012706  000500          5$:     MOV     #BUFF,SP
1048 007012  012767  007030  170770          MOV     #RETG5,RTRAP
1049 007020  012767  000357  170764          MOV     #357,RTRAP+2    ;SET NEW "CC" AND PRIORITY
1050 007026  000100                          JMP     %0              ;TRAP HERE
1051 007030                          RETG5:
1052 007030  100405                          BMI     1$
     007032  012737  000166  000302          MOV     #166,@#$FATAL   ;MOVE TO MAILBOX #  *******  166  *******
     007040  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007042  000000                          HALT                    ;N NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 707
1053 007044                          1$:
     007044  001405                          BEQ     2$
     007046  012737  000167  000302          MOV     #167,@#$FATAL   ;MOVE TO MAILBOX #  *******  167  *******
     007054  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007056  000000                          HALT                    ;Z NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 701
1054 007060                          2$:
```

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                007060  102405                          BVS     3$
                007062  012737  000170  000302          MOV     #170,@#$FATAL   ;MOVE TO MAILBOX #  *******  170  *******
                007070  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007072  000000                          HALT                    ;V NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 673
   1055         007074                          3$:
                007074  103405                          BCS     4$
                007076  012737  000171  000302          MOV     #171,@#$FATAL   ;MOVE TO MAILBOX #  *******  171  *******
                007104  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007106  000000                          HALT                    ;C NOT SET
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 665
   1056         007110  016706  170662          4$:     MOV     CC,SP
   1057         007114  022706  000357                  CMP     #357,SP
   1058         007120  001405                          BEQ     TST45
                007122  012737  000172  000302          MOV     #172,@#$FATAL   ;MOVE TO MAILBOX #  *******  172  *******
                007130  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007132  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 653
   1059                                         ;*****************************************************************************
                                                ;TEST 45        TEST THAT A TRAP OCCURES ON ALL ILLEGAL INS
                                                ;*****************************************************************************
                007134  005237  000304          TST45:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                007140  022737  000045  000304          CMP     #45,@#$TESTN    ;SEQUENCE ERROR?
                007146  001006                          BNE     TST46-12        ;BR TO ERROR HALT ON SEQ ERROR
   1060         007150  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
   1061         007154  012767  007176  170626          MOV     #RETH5,RTRAP    ;RETURN LOCATION
   1062         007162  004000                          JSR     %0,%0           ;RESERVED INS, SHOULD TRAP
   1063         007164  012737  000173  000302          MOV     #173,@#$FATAL   ;MOVE TO MAILBOX #  *******  173  *******
                007172  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007174  000000                          HALT                    ;DIDN'T TRAP,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 764
   1064         007176                          RETH5:
   1065                                         ;*****************************************************************************
                                                ;TEST 46        TEST DEC OF STACK POINTER ON A TRAP OPERATION
                                                ;*****************************************************************************
                007176  005237  000304          TST46:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                007202  022737  000046  000304          CMP     #46,@#$TESTN    ;SEQUENCE ERROR?
                007210  001011                          BNE     TST47-12        ;BR TO ERROR HALT ON SEQ ERROR
   1066         007212  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
   1067         007216  012767  007226  170564          MOV     #RETJ,RTRAP     ;RETURN POINTER
   1068         007224  004000                          JSR     %0,%0           ;RESERVED INS
   1069         007226  020627  000474          RETJ:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
   1070         007232  001405                          BEQ     TST47
                007234  012737  000174  000302          MOV     #174,@#$FATAL   ;MOVE TO MAILBOX #  *******  174  *******
                007242  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007244  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 761
   1071                                         ;*****************************************************************************
                                                ;TEST 47        TEST THAT PROPER P.C. IS SAVED
                                                ;*****************************************************************************
                007246  005237  000304          TST47:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                007252  022737  000047  000304          CMP     #47,@#$TESTN    ;SEQUENCE ERROR?
```

```
                007260  001012                          BNE     TST50-12        ;BR TO ERROR HALT ON SEQ ERROR
1072            007262  012706  000500                  MOV     #BUFF,SP        ;STACK POINTER SETUP
1073            007266  012767  007276  170514          MOV     #RETK,RTRAP     ;RETURN FROM TRAP POINTER
1074            007274  004000                  INSTK:  JSR     %0,%0           ;TRAP ON THIS INS
1075            007276  022767  007276  171170  RETK:   CMP     #INSTK+2,BUFF-4 ;CHECK FOR INCREMENED P.C.
1076            007304  001405                          BEQ     TST50
                007306  012737  000175  000302          MOV     #175,@#$FATAL   ;MOVE TO MAILBOX #  *******  175  *******
                007314  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007316  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 760
1077
1078                                            ;*******************************************************************************
                                                ;TEST 50        TEST THAT 'OLD'' CC AND PRI ARE PLACED ON STACK
                                                ;*******************************************************************************
                007320  005237  000304  TST50:  INC     @#$TESTN        ;UPDATE TEST NUMBER
                007324  022737  000050  000304  CMP     #50,@#$TESTN    ;SEQUENCE ERROR?
                007332  001040                  BNE     TST51-12        ;BR TO ERROR HALT ON SEQ ERROR
1079            007334  012706  000500          MOV     #BUFF,SP        ;SET UP
1080            007340  012767  007356  170442  MOV     #RETL,RTRAP     ;SET UP
1081            007346  005067  170424          CLR     CC              ;CLEAR CC AND PRIORITY
1082            007352  000257                  CCC
1083            007354  004000                  JSR     %0,%0           ;TRAP
1084            007356  026727  171114  000000  RETL:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1085            007364  001405                  BEQ     1$
                007366  012737  000176  000302          MOV     #176,@#$FATAL   ;MOVE TO MAILBOX #  *******  176  *******
                007374  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                007376  000000                          HALT                    ;INCORRCT STATUS
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 755
1086            007400  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
1087            007404  012767  007424  170376          MOV     #RETM,RTRAP     ;SET UP
1088            007412  012767  000357  170356          MOV     #357,CC         ;SET PRIORITY
1089            007420  000277                          SCC                     ;SET CC
1090            007422  004000                          JSR     %0,%0           ;TRAP
```

```
1092 007424 026727 171046 000357 RETM:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1093 007432 001405                       BEQ     TST51
     007434 012737 000177 000302         MOV     #177,@#$FATAL   ;MOVE TO MAILBOX #  *******  177  *******
     007442 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007444 000000                       HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 732
1094                                     ;*************************************************************************
                                         ;TEST 51        TEST THAT 'NEW' STATUS IS CORRECT
                                         ;*************************************************************************
     007446 005237 000304        TST51:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     007452 022737 000051 000304         CMP     #51,@#$TESTN    ;SEQUENCE ERROR?
     007460 001116                       BNE     TST52-12        ;BR TO ERROR HALT ON SEQ ERROR
1095 007462 012706 000500                MOV     #BUFF,SP
1096 007466 012767 007502 170314         MOV     #RETN,RTRAP
1097 007474 005067 170312                CLR     RTRAP+2 ;CLEAR FUTURE PRIORITY AND CC
1098 007500 004000                       JSR     %0,%0
1099 007502                      RETN:                           ;TEST FOR "C" CLEARED
1100 007502 100005                       BPL     1$
     007504 012737 000200 000302         MOV     #200,@#$FATAL   ;MOVE TO MAILBOX #  *******  200  *******
     007512 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007514 000000                       HALT                    ;C NOT CLEARED
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 761
1101 007516                      1$:
     007516 001005                       BNE     2$
     007520 012737 000201 000302         MOV     #201,@#$FATAL   ;MOVE TO MAILBOX #  *******  201  *******
     007526 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007530 000000                       HALT                    ;Z NOT CLEARED
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 753
1102 007532                      2$:
     007532 102005                       BVC     3$
     007534 012737 000202 000302         MOV     #202,@#$FATAL   ;MOVE TO MAILBOX #  *******  202  *******
     007542 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007544 000000                       HALT                    ;V NOT CLEARED
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 745
1103 007546                      3$:
     007546 103005                       BCC     4$
     007550 012737 000203 000302         MOV     #203,@#$FATAL   ;MOVE TO MAILBOX #  *******  203  *******
     007556 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007560 000000                       HALT                    ;C NOT CLEARED
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 737
1104 007562 016700 170210        4$:     MOV     CC,%0           ;TEMP STORAGE
1105 007566 001405                       BEQ     5$
     007570 012737 000204 000302         MOV     #204,@#$FATAL   ;MOVE TO MAILBOX #  *******  204  *******
     007576 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007600 000000                       HALT                    ;PRIORITY NOT ZERO
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 727
1106 007602 012706 000500        5$:     MOV     #BUFF,SP
1107 007606 012767 007624 170174         MOV     #RETO,RTRAP
1108 007614 012767 000357 170170         MOV     #357,RTRAP+2    ;SET NEW "CC" AND PRIORITY
1109 007622 004000                       JSR     %0,%0           ;TRAP HERE
1110 007624                      RETO:
```

```
1111 007624  100405                    BMI     1$
     007626  012737  000205  000302    MOV     #205,@#$FATAL   ;MOVE TO MAILBOX #  *******  205  *******
     007634  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007636  000000                    HALT                    ;N NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 710
1112 007640                        1$:
     007640  001405                    BEQ     2$
     007642  012737  000206  000302    MOV     #206,@#$FATAL   ;MOVE TO MAILBOX #  *******  206  *******
     007650  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007652  000000                    HALT                    ;Z NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 702
1113 007654                        2$:
     007654  102405                    BVS     3$
     007656  012737  000207  000302    MOV     #207,@#$FATAL   ;MOVE TO MAILBOX #  *******  207  *******
     007664  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007666  000000                    HALT                    ;V NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 674
1114 007670                        3$:
     007670  103405                    BCS     4$
     007672  012737  000210  000302    MOV     #210,@#$FATAL   ;MOVE TO MAILBOX #  *******  210  *******
     007700  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007702  000000                    HALT                    ;C NOT SET
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 666
1115 007704  016700  170066        4$:     MOV     CC,%0
1116 007710  022700  000357            CMP     #357,%0
1117 007714  001405                    BEQ     TST52
     007716  012737  000211  000302    MOV     #211,@#$FATAL   ;MOVE TO MAILBOX #  *******  211  *******
     007724  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007726  000000                    HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 654
1118
1119                               ;*************************************************************************************
                                   ;TEST 52        TEST THAT A TRAP OCCURES ON AN ILLEGAL ADDRESS
                                   ;*************************************************************************************
     007730  005237  000304    TST52:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     007734  022737  000052  000304    CMP     #52,@#$TESTN    ;SEQUENCE ERROR?
     007742  001040                    BNE     ERRP1           ;BR TO ERROR HALT ON SEQ ERROR
1120 007744  005037  177766            CLR     @#CPUERR                ;CLEAR CPU ERROR REGISTER
1121 007750  005737  177766            TST     @#CPUERR                ;VERIFY THAT IT CLEARED
1122 007754  001405                    BEQ     1$
     007756  012737  000212  000302    MOV     #212,@#$FATAL   ;MOVE TO MAILBOX #  *******  212  *******
     007764  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     007766  000000                    HALT                    ;CPU ERROR REG FAILED TO CLEAR
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 765
1123 007770  012706  000500        1$:     MOV     #BUFF,SP        ;STACK POINTER SETUP
1124 007774  012767  010020  170002        MOV     #RETP,RTRAP5    ;RETURN LOCATION
1125 010002  005767  167773            TST 1                   ;ILLEGAL ADDRESS INS, SHOULD TRAP
1126 010006  012737  000213  000302    MOV     #213,@#$FATAL   ;MOVE TO MAILBOX #  *******  213  *******
     010014  005212                    INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010016  000000                    HALT                    ;ILLEGAL ADDRESS DID NOT TRAP
                                                                ; TO SCOPE REPLACE HALT W/ 240
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                                                        ; AND REPLACE NEXT INST W/ 751
1127 010020                             RETP:
1128 010020  013767  177766  170454             MOV @#CPUERR,RCPUER     ;READ AND SAVE CPU ERROR REGISTER
1129 010026  042767  177413  170446             BIC     #CERMSK,RCPUER ;MASK OFF UNUSED BITS OF CPU ERROR REG
1130 010034  022767  000100  170440             CMP     #100,RCPUER     ;ODD ADDRESS BIT SET?
1131 010042  001405                             BEQ     CERR1
     010044                             ERRP1:
     010044  012737  000214  000302             MOV     #214,@#$FATAL   ;MOVE TO MAILBOX #  *******  214  *******
     010052  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010054  000000                             HALT                    ;INCORRECT CPU ERROR REG CONTENTS, OR WRONG $TSTNM
                                                                         ; TO SCOPE REPLACE HALT W/ 240
                                                                         ; AND REPLACE NEXT INST W/ 732
1132 010056  005037  177766             CERR1:  CLR     @#CPUERR        ;CLEAR ODD ADDRESS BIT
1133
1134                                    ;*****************************************************************************
                                        ;TEST 53        TEST DEC OF STACK POINTER ON A TRAP OPERATION
                                        ;*****************************************************************************
     010062  005237  000304             TST53:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     010066  022737  000053  000304             CMP     #53,@#$TESTN    ;SEQUENCE ERROR?
     010074  001012                             BNE     TST54-12        ;BR TO ERROR HALT ON SEQ ERROR
1135 010076  012706  000500                     MOV     #BUFF,SP        ;STACK POINTER SETUP
1136 010102  012767  010114  167674             MOV     #RETQ,RTRAP5    ;RETURN POINTER
1137 010110  005767  167665                     TST 1                   ;RESERVED INS
1138 010114  020627  000474             RETQ:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1139 010120  001405                             BEQ     TST54
     010122  012737  000215  000302             MOV     #215,@#$FATAL   ;MOVE TO MAILBOX #  *******  215  *******
     010130  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010132  000000                             HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                         ; TO SCOPE REPLACE HALT W/ 240
                                                                         ; AND REPLACE NEXT INST W/ 760
1140                                    ;*****************************************************************************
                                        ;TEST 54        TEST THAT PROPER P.C. IS SAVED
                                        ;*****************************************************************************
     010134  005237  000304             TST54:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     010140  022737  000054  000304             CMP     #54,@#$TESTN    ;SEQUENCE ERROR?
     010146  001013                             BNE     TST55-12        ;BR TO ERROR HALT ON SEQ ERROR
1141 010150  012706  000500                     MOV     #BUFF,SP        ;STACK POINTER SETUP
1142 010154  012767  010166  167622             MOV     #RETR,RTRAP5    ;RETURN FROM TRAP POINTER
1143 010162  005767  167613                     TST 1                   ;TRAP ON THIS INSTRUCTION
1144 010166  022767  010166  170300 RETR:       CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
1145 010174  001405                             BEQ     TST55
     010176  012737  000216  000302             MOV     #216,@#$FATAL   ;MOVE TO MAILBOX #  *******  216  *******
     010204  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010206  000000                             HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                         ; TO SCOPE REPLACE HALT W/ 240
                                                                         ; AND REPLACE NEXT INST W/ 757
1146                                    ;*****************************************************************************
                                        ;TEST 55        TEST THAT ''OLD'' CC AND PRI ARE PLACED ON STACK
                                        ;*****************************************************************************
     010210  005237  000304             TST55:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     010214  022737  000055  000304             CMP     #55,@#$TESTN    ;SEQUENCE ERROR?
     010222  001042                             BNE     TST56-12        ;BR TO ERROR HALT ON SEQ ERROR
1147 010224  012706  000500                     MOV     #BUFF,SP        ;SET UP
1148 010230  012767  010250  167546             MOV     #RETS,RTRAP5    ;SET UP
1149 010236  005067  167534                     CLR     CC              ;CLEAR CC AND PRIORITY
1150 010242  000257                             CCC
1151 010244  005767  167531                     TST 1                   ;TRAP
```

```
1152 010250  026727  170222  000000  RETS:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
1153 010256  001405                          BEQ     1$
     010260  012737  000217  000302          MOV     #217,@#$FATAL   ;MOVE TO MAILBOX #  *******  217  *******
     010266  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010270  000000                          HALT                    ;INCORRECT STATUS
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 754
1154 010272  012706  000500          1$:     MOV     #BUFF,SP        ;SET UP
1155 010276  012767  010320  167500          MOV     #RETT,RTRAP5    ;SET UP
1156 010304  012767  000357  167464          MOV     #357,CC         ;SET PRIORITY
1157 010312  000277                          SCC                     ;SET CC
1158 010314  005767  167461                  TST 1                   ;TRAP
1159 010320  026727  170152  000357  RETT:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
1160 010326  001405                          BEQ     TST56
     010330  012737  000220  000302          MOV     #220,@#$FATAL   ;MOVE TO MAILBOX #  *******  220  *******
     010336  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010340  000000                          HALT                    ;INCORRCT STATUS ON STACK,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 730
1161                                 ;*************************************************************************
                                     ;TEST 56        TEST THAT 'NEW' STATUS IS CORRECT
                                     ;*************************************************************************
     010342  005237  000304  TST56:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     010346  022737  000056  000304  CMP     #56,@#$TESTN    ;SEQUENCE ERROR?
     010354  001121                  BNE     TST57-12        ;BR TO ERROR HALT ON SEQ ERROR
1162 010356  012706  000500          MOV     #BUFF,SP
1163 010362  012767  010400  167414  MOV     #RETU,RTRAP5
1164 010370  005067  167412          CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
1165 010374  005767  167401          TST 1                   ;TRAP HERE
1166 010400                  RETU:                           ;TEST FOR ''C'' CLEARED
1167 010400  100005                  BPL     1$
     010402  012737  000221  000302  MOV     #221,@#$FATAL   ;MOVE TO MAILBOX #  *******  221  *******
     010410  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010412  000000                  HALT                    ;C NOT CLEARED
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 760
1168 010414                  1$:
     010414  001005                  BNE     2$
     010416  012737  000222  000302  MOV     #222,@#$FATAL   ;MOVE TO MAILBOX #  *******  222  *******
     010424  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010426  000000                  HALT                    ;Z NOT CLEARED
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 752
1169 010430                  2$:
     010430  102005                  BVC     3$
     010432  012737  000223  000302  MOV     #223,@#$FATAL   ;MOVE TO MAILBOX #  *******  223  *******
     010440  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010442  000000                  HALT                    ;V NOT CLEARED
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 744
1170 010444                  3$:
     010444  103005                  BCC     4$
     010446  012737  000224  000302  MOV     #224,@#$FATAL   ;MOVE TO MAILBOX #  *******  224  *******
     010454  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010456  000000                  HALT                    ;C NOT CLEARED
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 736
```

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1171 010460  032767  000357  167310  4$:     BIT     #357,CC         ;TEST PRIORITY FOR ZERO
1172 010466  001405                          BEQ     5$
     010470  012737  000225  000302          MOV     #225,@#$FATAL   ;MOVE TO MAILBOX #  *******  225  *******
     010476  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010500  000000                          HALT                    ;PRIORITY NOT ZERO
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 725
1173 010502  012706  000500          5$:     MOV     #BUFF,SP
1174 010506  012767  010526  167270          MOV     #RETV,RTRAP5
1175 010514  012767  000357  167264          MOV     #357,RTRAP5+2   ;SET NEW ''CC'' AND PRIORITY
1176 010522  005767  167253                  TST 1                   ;TRACE HERE
1177 010526                          RETV:
1178 010526  100405                          BMI     1$
     010530  012737  000226  000302          MOV     #226,@#$FATAL   ;MOVE TO MAILBOX #  *******  226  *******
     010536  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010540  000000                          HALT                    ;N NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 705
1179 010542                          1$:
     010542  001405                          BEQ     2$
     010544  012737  000227  000302          MOV     #227,@#$FATAL   ;MOVE TO MAILBOX #  *******  227  *******
     010552  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010554  000000                          HALT                    ;Z NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 677
1180 010556                          2$:
     010556  102405                          BVS     3$
     010560  012737  000230  000302          MOV     #230,@#$FATAL   ;MOVE TO MAILBOX #  *******  230  *******
     010566  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010570  000000                          HALT                    ;V NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 671
1181 010572                          3$:
     010572  103405                          BCS     4$
     010574  012737  000231  000302          MOV     #231,@#$FATAL   ;MOVE TO MAILBOX #  *******  231  *******
     010602  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010604  000000                          HALT                    ;C NOT SET
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 663
1182 010606  016700  167164          4$:     MOV     CC,%0
1183 010612  022700  000357                  CMP     #357,%0
1184 010616  001405                          BEQ     TST57
     010620  012737  000232  000302          MOV     #232,@#$FATAL   ;MOVE TO MAILBOX #  *******  232  *******
     010626  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010630  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 651
1185                                 ;******************************************************************************
                                     ;TEST 57        TEST THAT DEC R6 TO A VALUE LESS  400 TRAPS
                                     ;******************************************************************************
     010632  005237  000304          TST57:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     010636  022737  000057  000304          CMP     #57,@#$TESTN    ;SEQUENCE ERROR?
     010644  001027                          BNE     ERRP2           ;BR TO ERROR HALT ON SEQ ERROR
1186 010646  005037  177766                  CLR     @#CPUERR        ;CLEAR CPU ERROR REGISTER
1187 010652  012706  000150                  MOV     #150,%6         ;R6 = 150
1188 010656  012767  010700  167120          MOV     #TDEC1,4        ;STACK OVERFLOW TRAP POINTER
1189 010664  005746                          TST     -(6)            ;WITH R6 = 150 SHOULD TRAP
```

```
1190 010666  012737  000233  000302          MOV     #233,@#$FATAL   ;MOVE TO MAILBOX #  *******  233  *******
     010674  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010676  000000                          HALT                    ;SHOULD HAVE TRAPPED,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 762
1191 010700                          TDEC1:
1192 010700  013767  177766  167574          MOV @#CPUERR,RCPUER     ;SAVE CPU ERROR REGISTER
1193 010706  042767  177413  167566          BIC #CERMSK,RCPUER      ;MASK OFF UNUSED CPU ERROR REG BITS
1194 010714  022767  000004  167560          CMP     #4,RCPUER       ;IS YELLOW ZONE BIT SET?
1195 010722  001405                          BEQ     CERR2
     010724                          ERRP2:
     010724  012737  000234  000302          MOV     #234,@#$FATAL   ;MOVE TO MAILBOX #  *******  234  *******
     010732  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     010734  000000                          HALT                    ;INCORRECT CPU ERROR REGISTER CONTENTS, OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 743
1196 010736  005037  177766          CERR2:  CLR     @#CPUERR        ;CLEAR YELLOW ZONE BIT
1197
1198                                 ;*****************************************************************************
                                     ;TEST 60        TEST FOR DEC OF R6 ON OVERFLOW TRAP
                                     ;*****************************************************************************
     010742  005237  000304          TST60:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     010746  022737  000060  000304          CMP     #60,@#$TESTN    ;SEQUENCE ERROR?
     010754  001011                          BNE     TST61-12        ;BR TO ERROR HALT ON SEQ ERROR
1199 010756  012706  000150                  MOV     #150,%6         ;R6 = 150
1200 010762  012767  010772  167014          MOV     #TDEC2,4        ;TRAP POINTER
1201 010770  005746                          TST     -(6)            ;WITH R6 = 150 SHOULD TRAP
1202 010772  020627  000142          TDEC2:  CMP     %6,#142         ;DID R6 DECREMENT
1203 010776  001405                          BEQ     TST61
     011000  012737  000235  000302          MOV     #235,@#$FATAL   ;MOVE TO MAILBOX #  *******  235  *******
     011006  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     011010  000000                          HALT                    ;R6 NOT = 142,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 761
1204
```

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1206                                    ;*****************************************************************************
                                        ;TEST 61        TEST DIFFERENT TYPES OF OVERFLOW
                                        ;*****************************************************************************
     011012  005237  000304            TST61:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     011016  022737  000061  000304             CMP     #61,@#$TESTN    ;SEQUENCE ERROR?
     011024  001043                     BNE     TST62-12        ;BR TO ERROR HALT ON SEQ ERROR
1207 011026  012706  000150                     MOV     #150,%6
1208 011032  005067  167110                     CLR     146             ;STATUS WORD OF LOC 10
1209 011036  012767  011046  166740             MOV     #TDEC3,4        ;RETURN TO LOC 4
1210 011044  005246                     INC     -(6)
1211 011046  005767  167074            TDEC3:  TST     146
1212 011052  001005                     BNE     1$
     011054  012737  000236  000302             MOV     #236,@#$FATAL   ;MOVE TO MAILBOX #  *******  236  *******
     011062  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     011064  000000                     HALT                    ;INCREMENT OPERATION NOT INHIBITED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 757
1213 011066  012705  001000            1$:     MOV     #1000,%5
1214 011072  012706  000400                     MOV     #400,%6
1215 011076  012767  011120  166700             MOV     #TDEC4,4
1216 011104  124645                     CMPB    -(6),-(5)
1217 011106  012737  000237  000302             MOV     #237,@#$FATAL   ;MOVE TO MAILBOX #  *******  237  *******
     011114  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     011116  000000                     HALT                    ;STACK = 400 AND DECREMENTED, SHOULD TRAP
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 742
1218 011120  012706  000400            TDEC4:  MOV     #400,%6
1219 011124  012767  011146  166652             MOV     #TDEC7,4
1220 011132  134546                     BITB    -(5),-(6)
1221 011134                            TDEC6:
     011134  012737  000240  000302             MOV     #240,@#$FATAL   ;MOVE TO MAILBOX #  *******  240  *******
     011142  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     011144  000000                     HALT                    ;NO STACK OVERFLOW,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 727
1222 011146                            TDEC7:
1232
1233                                    ;*****************************************************************************
                                        ;TEST 62        TEST THAT AN 10 CAUSES AN OVERFLOW TRAP
                                        ;*****************************************************************************
     011146  005237  000304            TST62:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     011152  022737  000062  000304             CMP     #62,@#$TESTN    ;SEQUENCE ERROR?
     011160  001011                     BNE     VDEC2           ;BR TO ERROR HALT ON SEQ ERROR
     011162  012706  000400                     MOV     #400,%6         ;SET UP STACK TO OVERFLOW
     011166  012767  011204  166614             MOV     #VDEC2,10       ;SET UP 10 VECTOR
     011174  012767  011216  166602             MOV     #VDEC1,4        ;SET UP OVERFLOW VECTOR
     011202  000010                     10                      ;THIS TRAP SHOULD CAUSE OVERFLOW
     011204                             VDEC2:
     011204  012737  000241  000302             MOV     #241,@#$FATAL   ;MOVE TO MAILBOX #  *******  241  *******
     011212  005212                     INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     011214  000000                     HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 761
     011216  012767  000012  166564     VDEC1:  MOV     #10+2,10
1234                                    ;*****************************************************************************
                                        ;TEST 63        TEST THAT AN IOT CAUSES AN OVERFLOW TRAP
                                        ;*****************************************************************************
```

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011224  005237  000304          TST63:  INC     @#$TESTN        ;UPDATE TEST NUMBER
011230  022737  000063  000304        CMP     #63,@#$TESTN    ;SEQUENCE ERROR?
011236  001011                      BNE     VDEC4           ;BR TO ERROR HALT ON SEQ ERROR
011240  012706  000400              MOV     #400,%6         ;SET UP STACK TO OVERFLOW
011244  012767  011262  166546      MOV     #VDEC4,20       ;SET UP IOT VECTOR
011252  012767  011274  166524      MOV     #VDEC3,4        ;SET UP OVERFLOW VECTOR
011260  000004                      IOT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
011262                          VDEC4:
011262  012737  000242  000302      MOV     #242,@#$FATAL   ;MOVE TO MAILBOX #  *******  242  *******
011270  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
011272  000000                      HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 761
011274  012767  000022  166516  VDEC3:  MOV     #20+2,20
1235                            ;*****************************************************************************
                                ;TEST 64        TEST THAT AN EMT CAUSES AN OVERFLOW TRAP
                                ;*****************************************************************************
011302  005237  000304          TST64:  INC     @#$TESTN        ;UPDATE TEST NUMBER
011306  022737  000064  000304        CMP     #64,@#$TESTN    ;SEQUENCE ERROR?
011314  001011                      BNE     VDEC6           ;BR TO ERROR HALT ON SEQ ERROR
011316  012706  000400              MOV     #400,%6         ;SET UP STACK TO OVERFLOW
011322  012767  011340  166500      MOV     #VDEC6,30       ;SET UP EMT VECTOR
011330  012767  011352  166446      MOV     #VDEC5,4        ;SET UP OVERFLOW VECTOR
011336  104000                      EMT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
011340                          VDEC6:
011340  012737  000243  000302      MOV     #243,@#$FATAL   ;MOVE TO MAILBOX #  *******  243  *******
011346  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
011350  000000                      HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 761
011352  012767  000032  166450  VDEC5:  MOV     #30+2,30
1236                            ;*****************************************************************************
                                ;TEST 65        TEST THAT AN TRAP CAUSES AN OVERFLOW TRAP
                                ;*****************************************************************************
011360  005237  000304          TST65:  INC     @#$TESTN        ;UPDATE TEST NUMBER
011364  022737  000065  000304        CMP     #65,@#$TESTN    ;SEQUENCE ERROR?
011372  001011                      BNE     VDEC8           ;BR TO ERROR HALT ON SEQ ERROR
011374  012706  000400              MOV     #400,%6         ;SET UP STACK TO OVERFLOW
011400  012767  011416  166426      MOV     #VDEC8,34       ;SET UP TRAP VECTOR
011406  012767  011430  166370      MOV     #VDEC7,4        ;SET UP OVERFLOW VECTOR
011414  104400                      TRAP                    ;THIS TRAP SHOULD CAUSE OVERFLOW
011416                          VDEC8:
011416  012737  000244  000302      MOV     #244,@#$FATAL   ;MOVE TO MAILBOX #  *******  244  *******
011424  005212                      INC     (R2)            ;SET MSGTYP TO FATAL ERROR
011426  000000                      HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                            ; TO SCOPE REPLACE HALT W/ 240
                                                            ; AND REPLACE NEXT INST W/ 761
011430  012767  000036  166376  VDEC7:  MOV     #34+2,34
1237                            ;*****************************************************************************
                                ;TEST 66        TEST THAT AN TRT CAUSES AN OVERFLOW TRAP
                                ;*****************************************************************************
011436  005237  000304          TST66:  INC     @#$TESTN        ;UPDATE TEST NUMBER
011442  022737  000066  000304        CMP     #66,@#$TESTN    ;SEQUENCE ERROR?
011450  001011                      BNE     VDEC10          ;BR TO ERROR HALT ON SEQ ERROR
011452  012706  000400              MOV     #400,%6         ;SET UP STACK TO OVERFLOW
011456  012767  011474  166330      MOV     #VDEC10,14      ;SET UP TRT VECTOR
011464  012767  011506  166312      MOV     #VDEC9,4        ;SET UP OVERFLOW VECTOR
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        011472  000003                          TRT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
        011474                          VDEC10:
        011474  012737  000245  000302          MOV     #245,@#$FATAL   ;MOVE TO MAILBOX #  *******  245  *******
        011502  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        011504  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 761
        011506  012767  000016  166300  VDEC9:  MOV     #14+2,14
1238                                    ;*****************************************************************************
                                        ;TEST 67        TEST THAT AN ILLA CAUSES AN OVERFLOW TRAP
                                        ;*****************************************************************************
        011514  005237  000304          TST67:  INC     @#$TESTN        ;UPDATE TEST NUMBER
        011520  022737  000067  000304          CMP     #67,@#$TESTN    ;SEQUENCE ERROR?
        011526  001011                          BNE     VDEC11          ;BR TO ERROR HALT ON SEQ ERROR
        011530  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
        011534  012767  011552  166246          MOV     #VDEC11,10      ;SET UP ILLA VECTOR
        011542  012767  011564  166234          MOV     #VDEC12,4       ;SET UP OVERFLOW VECTOR
        011550  004700                          ILLA                    ;THIS TRAP SHOULD CAUSE OVERFLOW
        011552                          VDEC11:
        011552  012737  000246  000302          MOV     #246,@#$FATAL   ;MOVE TO MAILBOX #  *******  246  *******
        011560  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        011562  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 761
        011564  012767  000012  166216  VDEC12: MOV     #10+2,10
1239    011572  020627  000370                  CMP     %6,#370         ;STACK PUSHED FOUR WORDS?
1240    011576  001405                          BEQ     TST70
        011600  012737  000247  000302          MOV     #247,@#$FATAL   ;MOVE TO MAILBOX #  *******  247  *******
        011606  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        011610  000000                          HALT                    ;CORRECT # (4) OF WORDS WERE NOT PUSHED ONTO STACK
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 746
1241                                    ;*****************************************************************************
                                        ;TEST 70        TEST THAT AN ILLB CAUSES AN OVERFLOW TRAP
                                        ;*****************************************************************************
        011612  005237  000304          TST70:  INC     @#$TESTN        ;UPDATE TEST NUMBER
        011616  022737  000070  000304          CMP     #70,@#$TESTN    ;SEQUENCE ERROR?
        011624  001011                          BNE     VDEC13          ;BR TO ERROR HALT ON SEQ ERROR
        011626  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
        011632  012767  011650  166150          MOV     #VDEC13,10      ;SET UP ILLB VECTOR
        011640  012767  011662  166136          MOV     #VDEC14,4       ;SET UP OVERFLOW VECTOR
        011646  000100                          ILLB                    ;THIS TRAP SHOULD CAUSE OVERFLOW
        011650                          VDEC13:
        011650  012737  000250  000302          MOV     #250,@#$FATAL   ;MOVE TO MAILBOX #  *******  250  *******
        011656  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        011660  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 761
        011662  012767  000012  166120  VDEC14: MOV     #10+2,10
1242
1243                                    ;*****************************************************************************
                                        ;TEST 71        TEST FOR FALSE OVERFLOW TRAP
                                        ;*****************************************************************************
        011670  005237  000304          TST71:  INC     @#$TESTN        ;UPDATE TEST NUMBER
        011674  022737  000071  000304          CMP     #71,@#$TESTN    ;SEQUENCE ERROR?
        011702  001023                          BNE     FOVER           ;BR TO ERROR HALT ON SEQ ERROR
1244
```

```
1245 011704  012767  011752  166072          MOV     #FOVER,4        ;SET UP OVERFLOW POINTER
1246 011712  012706  001002                  MOV     #1002,%6
1247 011716  005746                          TST     -(6)            ;SHOULD NOT OVERFLOW
1248 011720  012706  002002                  MOV     #2002,%6
1249 011724  005746                          TST     -(6)            ;SHOULD NOT OVERFLOW
1250 011726  012706  004002                  MOV     #4002,%6
1251 011732  005746                          TST     -(6)            ;SHOULD NOT OVERFLOW
1252 011734  012706  010002                  MOV     #10002,%6
1253 011740  005746                          TST     -(6)
1254 011742  012706  020000                  MOV     #20000,%6       ;SHOULD NOT OVERFLOW
1255 011746  005746                          TST     -(6)
1256 011750  000405                          BR      STP
     011752                          FOVER:
     011752  012737  000251  000302          MOV     #251,@#$FATAL   ;MOVE TO MAILBOX #  *******  251  *******
     011760  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     011762  000000                          HALT                    ;IT OVERFLOWED,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 747
1257 011764  012767  000006  166012  STP:    MOV     #6,4
1258 011772  005067  166010                  CLR     6
1259                                 ;*************************************************************************************
                                     ;TEST 72        TEST THAT BIT 4 PSW WILL CAUSE A TRAP TO 14
                                     ;*************************************************************************************
     011776  005237  000304          TST72:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     012002  022737  000072  000304          CMP     #72,@#$TESTN    ;SEQUENCE ERROR?
     012010  001013                          BNE     TST73-12        ;BR TO ERROR HALT ON SEQ ERROR
1260 012012  012706  000500                  MOV     #BUFF,SP
1261 012016  012767  012052  165770          MOV     #RETAT,RTRAP4   ;SET UP TO TRAP TO 14
1262 012024  012746  000020                  MOV     #20,-(SP)       ;PUSH T BIT
1263 012030  012746  012036                  MOV     #.+6,-(SP)      ;PUSH PC
1264 012034  000002                          RTI                     ;SET T BIT
1265 012036  000240                          NOP                     ;TRAP HERE
1266 012040  012737  000252  000302          MOV     #252,@#$FATAL   ;MOVE TO MAILBOX #  *******  252  *******
     012046  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     012050  000000                          HALT                    ;TRACE BIT DID NOT TRAP!,OR WRONG $TESTN
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 757
1267 012052                          RETAT:
1268                                 ;*************************************************************************************
                                     ;TEST 73        TEST  STACK POINTER DECREMENTS
                                     ;*************************************************************************************
     012052  005237  000304          TST73:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     012056  022737  000073  000304          CMP     #73,@#$TESTN    ;SEQUENCE ERROR?
     012064  001023                          BNE     TST74-12        ;BR TO ERROR HALT ON SEQ ERROR
1269 012066  012706  000500                  MOV     #BUFF,SP
1270 012072  012767  012126  165714          MOV     #RETBT,RTRAP4
1271 012100  012746  000020                  MOV     #20,-(SP)       ;PUSH T BIT
1272 012104  012746  012112                  MOV     #.+6,-(SP)      ;PUSH PC
1273 012110  000002                          RTI                     ;SET T BIT
1274 012112  000240                          NOP                     ;TRAP HERE
1275 012114  012737  000253  000302          MOV     #253,@#$FATAL   ;MOVE TO MAILBOX #  *******  253  *******
     012122  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     012124  000000                          HALT                    ;TRACE BIT DID NOT TRAP!
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 757
1276 012126  020627  000474          RETBT:  CMP     SP,#BUFF-4
1277 012132  001405                          BEQ     TST74
```

```
012134  012737  000254  000302          MOV     #254,@#$FATAL   ;MOVE TO MAILBOX #  *******  254  *******
012142  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012144  000000                          HALT                    ;STACK POINTER WAS NOT PUSHED BY TRAP,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 747
1278                            ;*****************************************************************************
                                ;TEST 74        TEST  FOR PROPER PC ON STACK
                                ;*****************************************************************************
012146  005237  000304          TST74:  INC     @#$TESTN        ;UPDATE TEST NUMBER
012152  022737  000074  000304          CMP     #74,@#$TESTN    ;SEQUENCE ERROR?
012160  001016                          BNE     TST75-12        ;BR TO ERROR HALT ON SEQ ERROR
1279 012162  012706  000500             MOV     #BUFF,SP
1280 012166  012767  012206  165620     MOV     #RETCT,RTRAP4
1281 012174  012746  000020             MOV     #20,-(SP)       ;PUSH T BIT
1282 012200  012746  012206             MOV     #.+6,-(SP)      ;PUSH PC
1283 012204  000002                     RTI                     ;SET T BIT
1284                                                            ;TRAP HERE
1285 012206  022767  012206  166260  RETCT:  CMP     #.,BUFF-4
1286 012214  001405                     BEQ     TST75
012216  012737  000255  000302          MOV     #255,@#$FATAL   ;MOVE TO MAILBOX #  *******  255  *******
012224  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012226  000000                          HALT                    ;CORRECT PC WAS NOT SAVED ON STACK,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 754
1287
1288
1289                            ;*****************************************************************************
                                ;TEST 75        TEST  THAT RTT POPS T- BIT
                                ;*****************************************************************************
012230  005237  000304          TST75:  INC     @#$TESTN        ;UPDATE TEST NUMBER
012234  022737  000075  000304          CMP     #75,@#$TESTN    ;SEQUENCE ERROR?
012242  001015                          BNE     TST76-12        ;BR TO ERROR HALT ON SEQ ERROR
1290
1291 012244  012706  000500             MOV     #BUFF,SP
1292 012250  005001                     CLR     R1              ;CLEAR R1
1293 012252  012746  000020             MOV     #20,-(SP)
1294 012256  012746  012272             MOV     #RTT1,-(SP)
1295 012262  012767  012310  165524     MOV     #RTT2,14
1296 012270  000006                     RTT
1297 012272  000240                  RTT1:  NOP
1298 012274  001405                     BEQ     TST76
012276  012737  000256  000302          MOV     #256,@#$FATAL   ;MOVE TO MAILBOX #  *******  256  *******
012304  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
012306  000000                          HALT                    ;T-BIT DID NOT TRAP,OR WRONG $TESTN
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 755
1299
1300 012310                          RTT2:
1301                            ;*****************************************************************************
                                ;TEST 76        TEST  THAT RTT ALLOWS ONE INST. BEFORE TRAP
                                ;*****************************************************************************
012310  005237  000304          TST76:  INC     @#$TESTN        ;UPDATE TEST NUMBER
012314  022737  000076  000304          CMP     #76,@#$TESTN    ;SEQUENCE ERROR?
012322  001031                          BNE     TST77-12        ;BR TO ERROR HALT ON SEQ ERROR
1302 012324  012705  177777             MOV     #177777,%5
1303 012330  012706  000500          RTT5:  MOV     #BUFF,SP
1304 012334  012746  000020             MOV     #20,-(SP)
```

```
1305 012340  012746  012356                MOV     #RTT3,-(SP)
1306 012344  012767  012376  165442        MOV     #RTT4,14
1307 012352  005001                        CLR     R1              ;CLEAR R0
1308 012354  000006                        RTT                     ;SET T-BIT
1309 012356  005201                RTT3:   INC     R1
1310 012360  005205                        INC     %5
1311 012362  001762                        BEQ     RTT5            ;DO THIS TEST NO MORE THAN 2 TIMES
1312 012364  012737  000257  000302        MOV     #257,@#$FATAL   ;MOVE TO MAILBOX #  *******  257  *******
     012372  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     012374  000000                        HALT                    ;DID NOT TRAP
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 752
1313 012376  005301                RTT4:   DEC     R1              ;SEE IF RTT ALLOWS 1 INST.
1314 012400  001407                        BEQ     RTT6
1315 012402  005205                        INC     %5              ;DO THIS TEST NO MORE THAN TWO TIMES
1316 012404  001751                        BEQ     RTT5
     012406  012737  000260  000302        MOV     #260,@#$FATAL   ;MOVE TO MAILBOX #  *******  260  *******
     012414  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     012416  000000                        HALT                    ;RTT DID NOT ALLOW 1 INST.,OR WRONG $TESTN
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 741
1317 012420                        RTT6:
1318                               ;*****************************************************************************
                                   ;TEST 77        TEST  THAT RTI DOES NOT ALLOW 1 INST.
                                   ;*****************************************************************************
     012420  005237  000304        TST77:  INC     @#$TESTN        ;UPDATE TEST NUMBER
     012424  022737  000077  000304        CMP     #77,@#$TESTN    ;SEQUENCE ERROR?
     012432  001023                        BNE     TST100-12       ;BR TO ERROR HALT ON SEQ ERROR
1319 012434  012706  000500                MOV     #BUFF,SP
1320 012440  012746  000020                MOV     #20,-(SP)
1321 012444  012746  012462                MOV     #RTI1,-(SP)
1322 012450  012767  012476  165336        MOV     #RTI2,14
1323 012456  005001                        CLR     R1
1324 012460  000002                        RTI                     ;SET T-BIT
1325 012462  005201                RTI1:   INC     R1              ;RTI SHOULD NOT ALLOW THIS
1326 012464  012737  000261  000302        MOV     #261,@#$FATAL   ;MOVE TO MAILBOX #  *******  261  *******
     012472  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     012474  000000                        HALT                    ;T- BIT DID NOT CAUSE TRAP
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 756
1327 012476  005701                RTI2:   TST     R1
1328                                                                ;RTI SHOULD NOT ALLOW 1 INST. BEFORE TRAP
1329 012500  001405                        BEQ     TST100
     012502  012737  000262  000302        MOV     #262,@#$FATAL   ;MOVE TO MAILBOX #  *******  262  *******
     012510  005212                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     012512  000000                        HALT                    ;RTI DID ALLOW 1 INST. BEFORE TRAP,OR WRONG $TESTN
                                                                    ; TO SCOPE REPLACE HALT W/ 240
                                                                    ; AND REPLACE NEXT INST W/ 747
1330
1331                               ;*****************************************************************************
                                   ;TEST 100       DOES THE PROCESSOR TRAP WHEN %7 IS ODD?
                                   ;*****************************************************************************
     012514  005237  000304        TST100: INC     @#$TESTN        ;UPDATE TEST NUMBER
     012520  022737  000100  000304        CMP     #100,@#$TESTN   ;SEQUENCE ERROR?
     012526  001120                        BNE     TST101-12       ;BR TO ERROR HALT ON SEQ ERROR
1332 012530  012706  000500                MOV     #BUFF,%6        ;SET UP STACK POINTER
1333 012534  012767  012560  165242        MOV     #R7TR1,4        ;RETURN FROM TRAP
```

```
1334 012542  012707  000001              MOV    #1,%7           ;PC EQUALS ONE
1335 012546  012737  000263  000302      MOV    #263,@#$FATAL   ;MOVE TO MAILBOX #  *******  263  *******
     012554  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012556  000000                      HALT                   ;ODD ADDRESS SHOULD HAVE TRAPPED
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 763
1336 012560  022767  000001  165706 R7TR1:  CMP    #1,BUFF-4
1337 012566  001405                      BEQ    1$
     012570  012737  000264  000302      MOV    #264,@#$FATAL   ;MOVE TO MAILBOX #  *******  264  *******
     012576  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012600  000000                      HALT                   ;CORRECT PC WAS NOT SAVED ON STACK
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 752
1338
1339 012602  012706  000500         1$: MOV    #BUFF,%6        ;STACK POINTER
1340 012606  012767  012630  165170      MOV    #R7TR2,4
1341 012614  005207                      INC    %7              ;PC BECOMES ODD
1342 012616                         R7TR2A:
     012616  012737  000265  000302      MOV    #265,@#$FATAL   ;MOVE TO MAILBOX #  *******  265  *******
     012624  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012626  000000                      HALT                   ;
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 737
1343 012630  022767  012617  165636 R7TR2:  CMP    #R7TR2A+1,BUFF-4
1344 012636  001405                      BEQ    1$
     012640  012737  000266  000302      MOV    #266,@#$FATAL   ;MOVE TO MAILBOX #  *******  266  *******
     012646  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012650  000000                      HALT                   ;CORRECT PC NOT ON STACK
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 726
1345 012652  012706  000500         1$: MOV    #BUFF,%6
1346 012656  012767  012700  165120      MOV    #R7TR3,4
1347 012664  005307                 BR60:  DEC    %7              ;MAKE PC ODD
1348 012666  012737  000267  000302      MOV    #267,@#$FATAL   ;MOVE TO MAILBOX #  *******  267  *******
     012674  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012676  000000                      HALT                   ;SHOULD TRAP
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 713
1349 012700  022767  012665  165566 R7TR3:  CMP    #BR60+1,BUFF-4  ;CHECK VALUE OF PC ON STACK
1350 012706  001405                      BEQ    1$
     012710  012737  000270  000302      MOV    #270,@#$FATAL   ;MOVE TO MAILBOX #  *******  270  *******
     012716  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012720  000000                      HALT                   ;WRONG VALUE ON STACK
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 702
1351
1352 012722  012706  000500         1$: MOV    #BUFF,%6
1353 012726  012767  012752  165050      MOV    #R7TR4,4
1354 012734  000261                      SEC                    ;CARRY EQUALS A 1
1355 012736  006107                      ROL    %7              ;PC BECOMES ODD
1356 012740                         TR4A:
     012740  012737  000271  000302      MOV    #271,@#$FATAL   ;MOVE TO MAILBOX #  *******  271  *******
     012746  005212                      INC    (R2)            ;SET MSGTYP TO FATAL ERROR
     012750  000000                      HALT                   ;ODD ADDRESS DIDN'T TRAP
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 666
1357 012752  012767  000006  165024 R7TR4:  MOV    #6,4            ;RESET UP A HALT FOR TRAP
```

```
1358 012760 022767 025701 165506          CMP     #<2*TR4A+1>,BUFF-4 ;CHECK FOR VALUE ON STACK
1359 012766 001405                        BEQ     TST101
     012770 012737 000272 000302          MOV     #272,@#$FATAL      ;MOVE TO MAILBOX #  *******  272  *******
     012776 005212                        INC     (R2)               ;SET MSGTYP TO FATAL ERROR
     013000 000000                        HALT                       ;WRONG VALUE ON STACK,OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 652
1360                                ;*************************************************************************************
                                    ;TEST 101       TEST  THAT TRACE BIT TRAPS  INHIB ON TRAP INST
                                    ;*************************************************************************************
     013002 005237 000304           TST101: INC     @#$TESTN           ;UPDATE TEST NUMBER
     013006 022737 000101 000304             CMP     #101,@#$TESTN      ;SEQUENCE ERROR?
     013014 001027                           BNE     BR70               ;BR TO ERROR HALT ON SEQ ERROR
1361
1362 013016 012706 000500                    MOV     #BUFF,%6
1363 013022 012767 013062 164764             MOV     #TRACE,14          ;TRACE TRAP
1364 013030 005027 000016                    CLR     #16
1365 013034 005027 000022                    CLR     #22
1366 013040 012767 013106 164752             MOV     #TONT1,20          ;IOT TRAP
1367 013046 012746 000020                    MOV     #20,-(SP)          ;PUSH T BIT
1368 013052 012746 013060                    MOV     #.+6,-(SP)         ;PUSH PC
1369 013056 000006                           RTT
1370 013060 000004                           IOT                        ;TRAP, NEW CC HAVE TRACE RESET
1371 013062                         TRACE:
     013062 012737 000273 000302             MOV     #273,@#$FATAL      ;MOVE TO MAILBOX #  *******  273  *******
     013070 005212                           INC     (R2)               ;SET MSGTYP TO FATAL ERROR
     013072 000000                           HALT                       ;TRACE TRAP WAS NOT INHIBITED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 750
1372 013074                         BR70:
     013074 012737 000274 000302             MOV     #274,@#$FATAL      ;MOVE TO MAILBOX #  *******  274  *******
     013102 005212                           INC     (R2)               ;SET MSGTYP TO FATAL ERROR
     013104 000000                           HALT                       ;WRONG TSTNM,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 743
1373 013106 012767 000016 164700    TONT1:  MOV     #16,14
1374 013114 012767 000022 164676            MOV     #22,20
1375                                ;*************************************************************************************
                                    ;TEST 102       TEST THAT THE TRACE BIT IS SAVED IN THE STACK
                                    ;*************************************************************************************
     013122 005237 000304           TST102: INC     @#$TESTN           ;UPDATE TEST NUMBER
     013126 022737 000102 000304             CMP     #102,@#$TESTN      ;SEQUENCE ERROR?
     013134 001020                           BNE     STP3               ;BR TO ERROR HALT ON SEQ ERROR
1376 013136 012706 000500                    MOV     #BUFF,%6           ;SET UP STACK POINTER
1377 013142 012767 013166 164644             MOV     #TRC1,14           ;TRACE TRAP RETURN
1378 013150 005067 164642                    CLR     16
1379 013154 012746 000020                    MOV     #20,-(SP)          ;SET THE T BIT
1380 013160 012746 013166                    MOV     #TRC1,-(SP)
1381 013164 000002                           RTI
1382 013166 036727 165304 000020    TRC1:   BIT     BUFF-2,#20         ;CHECK FOR T BIT ON STACK
1383 013174 001005                           BNE     STP3D
     013176                         STP3:
     013176 012737 000275 000302             MOV     #275,@#$FATAL      ;MOVE TO MAILBOX #  *******  275  *******
     013204 005212                           INC     (R2)               ;SET MSGTYP TO FATAL ERROR
     013206 000000                           HALT                       ;T BIT NOT SAVED ON THE STACK,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 752
```

```
1384 013210  012767  000016  164576  STP3D:  MOV     #16,14
1385
1386
1387                                 ;THIS ROUTINE TEST THAT NO LEGAL ADDRESS TRAPS.
1388                                 ;AND THAT AN ILLEGAL ADDRESS TRAPS TO LOCATION 4
1389                                 ;*************************************************************************************
                                     ;TEST 103       TEST  NON-EXISTENT ADDRESS TRAPS
                                     ;*************************************************************************************
     013216  005237  000304          TST103: INC     @#$TESTN        ;UPDATE TEST NUMBER
     013222  022737  000103  000304          CMP     #103,@#$TESTN   ;SEQUENCE ERROR?
     013230  001160                          BNE     AUTO1           ;BR TO ERROR HALT ON SEQ ERROR
1390
1391                                 ;THIS ROUTINE TESTS MEMORY UNTIL IT DOES A NXM TRAP
1392 013232  000402                    BR      ADALL
1393 013234  000000                    TSL:    0
1394 013236  000000                    CORH:   0
1395 013240  005000                    ADALL:  CLR     %0
1396 013242  005037  177766                    CLR     @#CPUERR        ;CLEAR CPU ERROR REGISTER
1397 013246  005067  164534                    CLR     6
1398 013252  012767  013306  164524          MOV     #ATRAP,4        ;SET UP ADDRESS TRAP ENTRANCE
1399 013260  012706  000500              NOR:  MOV     #BUFF,SP
1400 013264  105720                          TSTB    (0)+            ;IF OUTSIDE OF CORE, TRAP TO 4
1401 013266  020027  160000                    CMP     %0,#160000              ;IS POINTER IN SIDE CORE
1402 013272  101772                          BLOS    NOR             ;TEST THE REST OF CORE
1403 013274                              AUTO:
     013274  012737  000276  000302          MOV     #276,@#$FATAL   ;MOVE TO MAILBOX #  *******  276  *******
     013302  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013304  000000                          HALT                    ;SHOULD HAVE TRAPED
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 751
1404                                 ;RETURN HERE ON AN ADDRESS TRAP
1405 013306  010067  177724          ATRAP:  MOV     R0,CORH         ;MOVE THE FIRST NXM LOCATION IN CORH
1406 013312  013767  177766  165162          MOV @#CPUERR,RCPUER     ;SAVE CPU ERROR REGISTER
1407 013320  042767  177413  165154          BIC     #CERMSK,RCPUER ;MASK OFF UNUSED ERROR REG BITS
1408 013326  020027  160000                    CMP     %0,#160000      ;WHICH CPU ERROR REG BIT SHOULD BE
1409                                                                 ;   SET - NON EXISTANT MEMORY (BIT 5)
1410                                                                 ;   OR UNIBUS TIMEOUT (BIT 4)
1411 013332  103012                          BHIS    1$              ;BRANCH IF UNIBUS TIMEOUT BIT SHOULD BE SET
1412 013334  022767  000040  165140          CMP     #40,RCPUER      ;IS NON-EXISTANT MEMORY BIT SET?
1413 013342  001417                          BEQ     2$
     013344  012737  000277  000302          MOV     #277,@#$FATAL   ;MOVE TO MAILBOX #  *******  277  *******
     013352  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013354  000000                          HALT                    ;INCORRECT CPU ERROR REG CONTENTS
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 725
1414 013356  000411                    BR 2$
1415 013360  022767  000020  165114  1$:      CMP     #20,RCPUER      ;IS UNIBUS TIMEOUT BIT SET?
1416 013366  001405                          BEQ     2$
     013370  012737  000300  000302          MOV     #300,@#$FATAL   ;MOVE TO MAILBOX #  *******  300  *******
     013376  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013400  000000                          HALT                    ;INCORRECT CPU ERROR REG CONTENTS
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 713
1417                                 ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTANT MEMORY LOCATION
1418 013402  012700  160001          2$:     MOV     #160001,R0      ;SET UP THE HIGHEST MEM LOCATION
1419 013406  005037  177766          CTRAP:  CLR     @#CPUERR        ;CLEAR CPU ERROR REGISTER
1420 013412  012767  013452  164364          MOV     #BTRAP,4        ;SET UP THE VECTOR
```

```
1421 013420 012706 000500                MOV     #BUFF,SP
1422 013424 105740                       TSTB    -(R0)           ;DOES IT EXIST?
1423 013426 005200                DTRAP: INC     R0              ;IF YES INCREMENT IT
1424 013430 020067 177602                CMP     R0,CORH         ;IS IT THE SAME LOCATION?
1425 013434 001463                       BEQ     TRAPB
     013436 012737 000301 000302         MOV     #301,@#$FATAL   ;MOVE TO MAILBOX #  *******  301  *******
     013444 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013446 000000                       HALT                    ;CONTENTS OF R0 AND CORH SHOULD HAVE BEEN EQUAL
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 670
1426                                                             ;IF THIS COMPARISON FAILS IT MEANS
1427                                                             ;THAT SOME LEGAL ADDRESS TRAPPED OR
1428                                                             ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
1429 013450 000455                       BR TRAPB
1430
1431 013452 005767 164320         BTRAP: TST STATUS
1432 013456 001405                       BEQ     3$
     013460 012737 000302 000302         MOV     #302,@#$FATAL   ;MOVE TO MAILBOX #  *******  302  *******
     013466 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013470 000000                       HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 657
1433
1434 013472 013767 177766 165002  3$:    MOV @#CPUERR,RCPUER     ;SAVE CPU ERROR REGISTER
1435 013500 042767 177413 164774         BIC     #CERMSK,RCPUER ;MASK OFF UNUSED ERROR REG BITS
1436 013506 020027 160000                CMP     %0,#160000      ;WHICH CPU ERROR REG BIT SHOULD BE
1437                                                             ;  SET - NON EXISTANT MEMORY (BIT 5)
1438                                                             ;  OR UNIBUS TIMEOUT (BIT 4)
1439 013512 103012                       BHIS    1$              ;BRANCH IF UNIBUS TIMEOUT BIT SHOULD BE SET
1440 013514 022767 000040 164760         CMP     #40,RCPUER      ;IS NON-EXISTANT MEMORY BIT SET?
1441 013522 001417                       BEQ     2$
     013524 012737 000303 000302         MOV     #303,@#$FATAL   ;MOVE TO MAILBOX #  *******  303  *******
     013532 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013534 000000                       HALT                    ;INCORRECT CPU ERROR REG CONTENTS
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 635
1442 013536 000411                       BR 2$
1443 013540 022767 000020 164734  1$:    CMP     #20,RCPUER      ;IS UNIBUS TIMEOUT BIT SET?
1444 013546 001405                       BEQ     2$
     013550 012737 000304 000302         MOV     #304,@#$FATAL   ;MOVE TO MAILBOX #  *******  304  *******
     013556 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013560 000000                       HALT                    ;INCORRECT CPU ERROR REG CONTENTS
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 623
1445 013562 026727 164706 013426  2$:    CMP     BUFF-4,#DTRAP
1446 013570 001706                       BEQ     CTRAP
     013572                      AUTO1:
     013572 012737 000305 000302         MOV     #305,@#$FATAL   ;MOVE TO MAILBOX #  *******  305  *******
     013600 005212                       INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013602 000000                       HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
                                                                 ; TO SCOPE REPLACE HALT W/ 240
                                                                 ; AND REPLACE NEXT INST W/ 612
1447 013604 012767 000006 164172  TRAPB: MOV     #6,4
1448 013612 005067 164170                CLR     6
1449                                     ;THIS ROUTINE WILL FIGURE OUT IF YOU HAVE A DL11W
1450
1451 013616 005067 000020                CLR     PROFTE
```

```
1452 013622  012706  000500          MOV     #BUFF,SP        ;SET UP THE STACK POINTER
1453 013626  012767  013644  164150  MOV     #DL11W,4        ;SET UP THE TRAP VECTOR
1454 013634  005767  163724          TST     TPS             ;TEST THE PUNCH STATUS REGISTER
1455 013640  000403                  BR      DL11W1          ;BRANCH IF IT EXISTS
1456 013642  000000          PROFTE: 000000
1457 013644  005267  177772  DL11W:  INC     PROFTE          ;INCREMENT IF NO DL11W
1458 013650  012767  000006  164126  DL11W1: MOV     #6,4
1459
1460                          ;*****************************************************************************
                              ;TEST 104       TEST THAT A TTY INRUP CAUSES AN OVERFLOW TRAP
                              ;*****************************************************************************
     013656  005237  000304  TST104: INC     @#$TESTN        ;UPDATE TEST NUMBER
     013662  022737  000104  000304  CMP     #104,@#$TESTN   ;SEQUENCE ERROR?
     013670  001031                  BNE     TDEC8           ;BR TO ERROR HALT ON SEQ ERROR
1461 013672  005767  177744          TST     PROFTE
1462 013676  001042                  BNE     R7TRX
1463 013700  000005                  RESET
1464 013702  012767  000340  164066  MOV     #340,STATUS     ;LOCK OUT INTERRUPT
1465 013710  012706  000400          MOV     #400,%6         ;SET UP STACK TO OVERFLOW
1466 013714  012767  013766  164062  MOV     #TDEC77,4       ;SET UP OVERFLOW TRAP
1467 013722  012767  013754  164134  MOV     #TDEC8,64       ;SET UP INTERRUPT VECTOR
1468 013730  012767  000100  163626  MOV     #100,TTCSR      ;SET INTERRUPT ENABLE
1469 013736  005067  164034          CLR     STATUS          ;ALLOW INTERRUPT TO OCCUR
1470 013742  012737  000306  000302  MOV     #306,@#$FATAL   ;MOVE TO MAILBOX #  *******  306  *******
     013750  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013752  000000                  HALT                    ;NO INTERRUPT OCCURRED
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 746
1471 013754                  TDEC8:
     013754  012737  000307  000302  MOV     #307,@#$FATAL   ;MOVE TO MAILBOX #  *******  307  *******
     013762  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     013764  000000                  HALT                    ;OVERFLOW TRAP DID NOT OCCUR OR WRONG $TSTNM
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 741
1472 013766  005067  163572  TDEC77: CLR     TTCSR           ;CLEAR INTERRUPT ENABLE
1473 013772  012767  000006  164004  MOV     #6,4
1474 014000  005067  164002          CLR     6
1475 014004                  R7TRX:
1476                          ;*****************************************************************************
                              ;TEST 105       TEST THAT A TRAP OCCURS BEFORE INRUPT
                              ;*****************************************************************************
     014004  005237  000304  TST105: INC     @#$TESTN        ;UPDATE TEST NUMBER
     014010  022737  000105  000304  CMP     #105,@#$TESTN   ;SEQUENCE ERROR?
     014016  001037                  BNE     TR2             ;BR TO ERROR HALT ON SEQ ERROR
1477 014020  005767  177616          TST     PROFTE
1478 014024  001046                  BNE     NODL
1479 014026  012706  000500          MOV     #BUFF,%6
1480 014032  012767  000340  163736  MOV     #340,STATUS     ;SET TO A HIGH PRIORITY LEVEL
1481 014040  012767  014104  164016  MOV     #TR0,64
1482 014046  012767  000100  163510  MOV     #100,TTCSR      ;INTERRUPT FOR TTY PUNCH/PRINTER
1483 014054  012767  014130  163752  MOV     #BR71,34        ;TRAP VECTOR
1484 014062  012767  014116  163774  MOV     #TR2,64         ;TTY VECTOR
1485 014070  012767  000340  163740  MOV     #340,36         ;IF TRAP TRAPS, MOVE 340 TO PRIORITY
1486 014076  005067  163674          CLR     STATUS          ;SHOULD INTERRUPT AT END OF CLR INST
1487 014102  104400                  TRAP                    ;TTY INTERRUPT SHOULD OVERRIDE TRAP
1488 014104                  TR0:
     014104  012737  000310  000302  MOV     #310,@#$FATAL   ;MOVE TO MAILBOX #  *******  310  *******
```

```
        014112  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        014114  000000                          HALT                    ;NEITHER TRAP NOR INRUPT OCCURED
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 740
  1489  014116                          TR2:
        014116  012737  000311  000302          MOV     #311,@#$FATAL   ;MOVE TO MAILBOX #  *******  311  *******
        014124  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        014126  000000                          HALT                    ;INRUPT OCCURRED FIRST,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 733
  1490  014130  005067  163702          BR71:   CLR     36
  1491  014134  042767  000100  163422          BIC     #100,TTCSR
  1492  014142                          NODL:
  1493                                  ;*************************************************************************************
                                        ;TEST 106       TEST THAT A PENDING INRUP, INRUP BETWEEN TRAPS
                                        ;*************************************************************************************
        014142  005237  000304          TST106: INC     @#$TESTN        ;UPDATE TEST NUMBER
        014146  022737  000106  000304          CMP     #106,@#$TESTN   ;SEQUENCE ERROR?
        014154  001031                          BNE     TR5             ;BR TO ERROR HALT ON SEQ ERROR
  1494  014156  005767  177460                  TST     PROFTE
  1495  014162  001046                          BNE     NODL1
  1496  014164  012706  000500                  MOV     #BUFF,%6
  1497  014170  012767  000340  163600          MOV     #340,STATUS
  1498  014176  012767  000100  163360          MOV     #100,TTCSR
  1499  014204  012767  014236  163622          MOV     #TR3,34         ;TRAP
  1500  014212  012767  014252  163644          MOV     #TR4,64         ;TTY OUTPUT
  1501  014220  012767  014240  163572          MOV     #TR5,20         ;IOT
  1502  014226  012767  000340  163566          MOV     #340,22         ;IOT PRIORITY
  1503  014234  104400                          TRAP                    ;THE ACT OF TRAPPING LOWER PRIORITY
  1504  014236  000004                  TR3:    IOT                     ;INTERRUPT SHOULD OCCUR IN PLACE OF IOT TRAP
  1505  014240                          TR5:
        014240  012737  000312  000302          MOV     #312,@#$FATAL   ;MOVE TO MAILBOX #  *******  312  *******
        014246  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        014250  000000                          HALT                    ;NO INTERRUPT BETWEEN TRAPS,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 741
  1506  014252  005067  163544          TR4:    CLR     22              ;CLR IOT PRIORITY
  1507  014256  012767  000036  163550          MOV     #36,34
  1508  014264  012767  000066  163572          MOV     #66,64
  1509  014272  012767  000022  163520          MOV     #22,20
  1510  014300                          NODL1:
  1511
  1512                                  ;*************************************************************************************
                                        ;TEST 107       TEST THAT 'RESET' GOES TO OUTSIDE WORLD
                                        ;*************************************************************************************
        014300  005237  000304          TST107: INC     @#$TESTN        ;UPDATE TEST NUMBER
        014304  022737  000107  000304          CMP     #107,@#$TESTN   ;SEQUENCE ERROR?
        014312  001027                          BNE     TST110-12       ;BR TO ERROR HALT ON SEQ ERROR
  1513  014314  005767  177322                  TST     PROFTE
  1514  014320  001031                          BNE     NODL2
  1515  014322  012767  000100  163234          MOV     #100,TTCSR      ;SET INTERRUPT ENABLE
  1516  014330  012767  000100  163222          MOV     #100,TRCSR      ;SET INTERRUPT ENABLE
  1517  014336  000005                          RESET                   ;SHOULD CLEAR INTERRUPT ENABLE
  1518  014340  032767  000100  163216          BIT     #100,TTCSR      ;TEST FOR CLEAR
  1519  014346  001405                          BEQ     1$
        014350  012737  000313  000302          MOV     #313,@#$FATAL   ;MOVE TO MAILBOX #  *******  313  *******
        014356  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
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        014360  000000                          HALT                    ;RESET FAILED TO CLEAR TTCSR
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 754
  1520  014362  032767  000100  163170  1$:     BIT     #100,TRCSR      ;TEST FOR CLEAR
  1521  014370  001405                          BEQ     TST110
        014372  012737  000314  000302          MOV     #314,@#$FATAL   ;MOVE TO MAILBOX #  *******  314  *******
        014400  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        014402  000000                          HALT                    ;RESET FAILED TO CLEAR TRCSR,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 743
  1522  014404                          NODL2:
  1523                                  ;*************************************************************************************
                                        ;TEST 110       TEST THAT RESET HAS NO EFFECT ON  TRACE TRAP
                                        ;*************************************************************************************
        014404  005237  000304          TST110: INC     @#$TESTN        ;UPDATE TEST NUMBER
        014410  022737  000110  000304          CMP     #110,@#$TESTN   ;SEQUENCE ERROR?
        014416  001014                          BNE     RESET3          ;BR TO ERROR HALT ON SEQ ERROR
  1524  014420  012706  000500                  MOV     #BUFF,%6        ;SET STACK
  1525  014424  012767  014462  163362          MOV     #RESET2,14      ;SET UP TRACE VECTOR
  1526  014432  012746  000020                  MOV     #20,-(R6)       ;SET THE T-BIT ON STACK
  1527  014436  012746  014444                  MOV     #1$,-(R6)       ;MOVE NEW PC ON STACK
  1528  014442  000006                          RTT
  1529  014444  000005                  1$:     RESET                   ;SHOULD HAVE NO EFFECT
  1530  014446  000005                          RESET                   ;NO EFFECT
  1531  014450                          RESET3:
        014450  012737  000315  000302          MOV     #315,@#$FATAL   ;MOVE TO MAILBOX #  *******  315  *******
        014456  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        014460  000000                          HALT                    ;TRACE TRAP FAILED,OR WRONG $TSTNM
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 756
  1532  014462  005067  163310          RESET2: CLR     STATUS          ;CLEAR TRACK
  1533  014466  005067  163324                  CLR     16              ;TRACE STATUS
  1534  014472  012767  000016  163314          MOV     #16,14
  1535
  1536                                  ;*************************************************************************************
                                        ;TEST 111       TEST THAT WHEN TTY INRUPTS IT POPS NEW STATUS
                                        ;*************************************************************************************
        014500  005237  000304          TST111: INC     @#$TESTN        ;UPDATE TEST NUMBER
        014504  022737  000111  000304          CMP     #111,@#$TESTN   ;SEQUENCE ERROR?
        014512  001051                          BNE     TTY11           ;BR TO ERROR HALT ON SEQ ERROR
  1537  014514  005767  177122                  TST     PROFTE
  1538  014520  001055                          BNE     NODL3
  1539  014522  000005                          RESET
  1540  014524  012706  000500                  MOV     #BUFF,%6        ;SET UP STACK
  1541  014530  012767  014554  163326          MOV     #TTY3,64        ;INTERRUPT VECTOR
  1542  014536  005067  163234                  CLR     STATUS          ;DROP PROCESSOR PRIORITY
  1543  014542  012767  000357  163316          MOV     #357,66         ;HIGH PRIORITY ON INTERRUPT
  1544  014550  005167  163010                  COM     TTCSR           ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
  1545  014554  026727  163216  000357  TTY3:   CMP     STATUS,#357
  1546  014562  001405                          BEQ     1$
        014564  012737  000316  000302          MOV     #316,@#$FATAL   ;MOVE TO MAILBOX #  *******  316  *******
        014572  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        014574  000000                          HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 746
  1547  014576  000005                  1$:     RESET                   ;CLR NTERRUPT ENABLE
  1548  014600  012706  000500                  MOV     #BUFF,%6        ;STACK SET UP
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```
1549 014604  012767  014630  163252          MOV     #TTY4,64        ;INTERRUPT VECTOR
1550 014612  005067  163250                  CLR     66              ;CLR NEW STATUS
1551 014616  012767  000157  163152          MOV     #157,STATUS     ;PROCESSOR STATUS
1552 014624  005167  162734                  COM     TTCSR           ;SET INTERRUPT ENABLE
1553 014630  005767  163142          TTY4:   TST     STATUS
1554 014634  001405                  BEQ     TTT37
     014636                          TTY11:
     014636  012737  000317  000302          MOV     #317,@#$FATAL   ;MOVE TO MAILBOX #  *******  317  *******
     014644  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     014646  000000                  HALT                    ;INCORRECT STATUS,OR WRONG $TSTNM
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 721
1555 014650  005067  162710          TTT37:  CLR     TTCSR
1556 014654                          NODL3:
1557
1558                                 ;*************************************************************************************
                                     ;TEST 112       TEST THE 'WAIT' INSTRUCTION
                                     ;*************************************************************************************
     014654  005237  000304          TST112: INC     @#$TESTN        ;UPDATE TEST NUMBER
     014660  022737  000112  000304          CMP     #112,@#$TESTN   ;SEQUENCE ERROR?
     014666  001060                  BNE     WATE5           ;BR TO ERROR HALT ON SEQ ERROR
1559 014670  005767  176746                  TST PROFTE
1560 014674  001064                  BNE NODL4
1561 014676  042767  000100  162660          BIC     #100,TPS        ;CLEAR INTERRUPT ENABLE
1562 014704  012706  000500                  MOV     #BUFF,SP        ;SET UP THE STACK
1563 014710  012767  015000  163146          MOV     #WATE,64        ;SET UP THE INTERRUPT VECTOR
1564 014716  005067  163144                  CLR     66
1565 014722  105767  162636          WATE1:  TSTB    TPS             ;WAIT FOR READY
1566 014726  100375                  BPL     WATE1           ;TO BE UP
1567 014730  012767  000015  162630          MOV     #15,TPB         ;DO A CARRIAGE RETURN
1568 014736  105767  162622          WATE2:  TSTB    TPS             ;WAIT FOR READY TO COME UP
1569 014742  100375                  BPL     WATE2
1570 014744  012767  000015  162614          MOV     #15,TPB         ;DO ANOTHER CARRIAGE RETURN
1571 014752  052767  000100  162604          BIS     #100,TPS        ;SET THE INTERRUPT ENABLE
1572 014760  005067  163012                  CLR     STATUS          ;CLEAR THE PSW
1573 014764  000001                  WATE3:  WAIT                    ;WAIT FOR THE INTERRUPT
1574 014766  012737  000320  000302          MOV     #320,@#$FATAL   ;MOVE TO MAILBOX #  *******  320  *******
     014774  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     014776  000000                  HALT                    ;WAIT INSTRUCTION DID NOT LOOP
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 733
1575 015000  005767  162772          WATE:   TST     STATUS  ;IS THE PSW CORRECT?
1576 015004  001405                  BEQ     1$
     015006  012737  000321  000302          MOV     #321,@#$FATAL   ;MOVE TO MAILBOX #  *******  321  *******
     015014  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     015016  000000                  HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 723
1577 015020  026727  163450  014766  1$:     CMP     BUFF-4,#WATE3+2 ;IS THE OLD PC SAVED
1578 015026  001405                  BEQ     WATE4
     015030                          WATE5:
     015030  012737  000322  000302          MOV     #322,@#$FATAL   ;MOVE TO MAILBOX #  *******  322  *******
     015036  005212                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     015040  000000                  HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
                                                             ; TO SCOPE REPLACE HALT W/ 240
                                                             ; AND REPLACE NEXT INST W/ 712
1579 015042  005067  162516          WATE4:  CLR     TPS             ;CLEAR INTERRUPT ENABLE
```

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1580 015046                                NODL4:
1581
1582                                       ;*****************************************************************************
                                           ;TEST 113       TEST THAT ALL RESERVED INS TRAP
                                           ;*****************************************************************************
     015046  005237  000304                TST113: INC     @#$TESTN        ;UPDATE TEST NUMBER
     015052  022737  000113  000304                CMP     #113,@#$TESTN   ;SEQUENCE ERROR?
     015060  001140                               BNE     RET4            ;BR TO ERROR HALT ON SEQ ERROR
1583 015062  012737  015110  000244                MOV     #TRAP244,@#244  ; SET UP TO SEE IF
1584 015070  013767  000010  000042                MOV     @#10,TENSAVE    ;  THIS PROCESSOR HAS THE
1585 015076  012737  015120  000010                MOV     #TRAP10,@#10    ;  FLOATING POINT OPTION
1586 015104  170007                               .WORD   170007          ; AN ILLEGAL FPP INSTRUCTION
1587 015106  000415                               BR      TSFCIS
1588 015110                                TRAP244:                        ; IF FPP IN--
1589 015110  013767  015512  000400                MOV     @#FPP,FINISH    ;  RESET END OF TABLE POINTER
1590 015116  000002                               RTI                     ; AND RETURN
1591 015120                                TRAP10:                         ; LEAVE THE TABLE ALONE
1592 015120  005737  000306                       TST     @#$PASS         ;FIRST PASS??
1593 015124  001004                               BNE     1$              ;BRANCH IF NO
1594 015126  012700  017335                       MOV     #MSGNFP,R0
1595 015132  004767  002362                       JSR     PC,PRTMSG       ;PRINT MESSAGE POINTED TO BY R0
1596 015136  000002                        1$:    RTI                     ; RETURN
1597 015140  000000                        TENSAVE:.WORD  0               ; A PLACE TO STORE CONTENTS OF 10
1598 015142                                TSFCIS:                 ;SEE IF PROCESSOR HAS CIS OPTION
1599 015142  012737  015220  000004                MOV     #AROUND,@#4     ;SET TIME OUT TRAP VECTOR
1600
1601 015150  012737  015170  000010                MOV     #TNCIS,@#10   ;SET UP RESERVE INST TRAP VECTOR
1602 015156  012700  160000                       MOV     #160000,R0      ;POINT R0 TO NON-EXISTED MEMORY LOC.
1603 015162  076020                               .WORD   76020           ;CIS INST = L2DR (DESTROYS CONTENTS OF R0,R1,R2,R3)
1604 015164  000000                               HALT                    ;CIS INST FAILED TO TRAP
1605 015166  000421                               BR      ADJNC
1606 015170                                TNCIS:  ;NO CIS OPTION,EXPECTED TRAP ETHER  TO 4 OR 10 DID NOT HAPPEN
1607
1608 015170  005737  000306                       TST     @#$PASS         ;FIRST PASS
1609 015174  001004                               BNE     1$
1610 015176  012700  017400                       MOV     #MSGNCIS,R0
1611 015202  004767  002312                       JSR     PC,PRTMSG       ;PRINT MESSAGE POINTED TO BY R0
1612 015206  012703  015406                1$:    MOV     #TABLE1,TAB
1613 015212  062716  000002                       ADD#2,(SP)
1614 015216  000002                               RTI
1615 015220  012703  015436                AROUND: MOV     #TABLE,TAB      ;CIS OPTION PRESENT
1616 015224  062716  000002                       ADD#2,(SP)
1617 015230  000002                               RTI
1618 015232  012737  000246  000244        ADJNC:  MOV     #246,@#244      ;  RESTORE THE TRAP VECTOR
1619 015240  016737  177674  000010                MOV     TENSAVE,@#10    ; RESTORE THE ILLEGAL INST. VECTOR
1620 015246  012305                        GIN1:   MOV     (TAB)+,FIRST    ;FIRST OR CURRENT INSTRUCTION
1621 015250  012301                                MOV     (TAB)+,LAST     ;LAST INSTRUCTION OR GROUP
1622 015252  020567  000240                       CMP     FIRST,FINISH    ;TESTED ALL
1623 015256  001525                               BEQ     GIN3            ;YES BRANCH
1624 015260  010567  000234                       MOV     FIRST,INST      ;SET UP INST
1625 015264  005267  000230                GIN2:   INC     INST
1626 015270  012767  015312  162512                MOV     #RET,10         ;SET UP RETURN FROM TRAP
1627 015276  012706  000500                       MOV     #BUFF,SP        ;SET UP STACK POINTER
1628 015302  005067  162470                       CLR     CC              ;CLEAR PRIORITY
1629 015306  000167  000206                       JMP     INST            ;EXECUTE RESERVED INSTRUCTION
1630
1631                                       ;TRAPPING SHOULD SEND YOU HERE
```

```
1632 015312  020627  000474          RET:    CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
1633 015316  001405                          BEQ     RET1
1634 015320  012737  000323  000302          MOV     #323,@#$FATAL   ;MOVE TO MAILBOX #  *******  323  *******
     015326  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     015330  000000                          HALT                    ;WRONG DECREMENT
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 653
1635 015332  026727  163136  015522  RET1:   CMP     BUFF-4,#INST+2  ;LOC OF INST UNINCREMENTED
1636 015340  001405                          BEQ     RET2
1637 015342  012737  000324  000302          MOV     #324,@#$FATAL   ;MOVE TO MAILBOX #  *******  324  *******
     015350  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     015352  000000                          HALT                    ;INST INC ON TRAP
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 642
1638 015354  005767  163116          RET2:   TST     BUFF-2
1639 015360  001405                          BEQ     RET3
     015362                          RET4:
     015362  012737  000325  000302          MOV     #325,@#$FATAL   ;MOVE TO MAILBOX #  *******  325  *******
     015370  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     015372  000000                          HALT                    ;CONDITION CODES SET ON TRAP OR WRONG $TSTNM
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 632
1640 015374  026701  000120          RET3:   CMP     INST,LAST
1641 015400  001722                          BEQ     GIN1            ;SET UP NEW GROUP
1642 015402  000167  177656                  JMP     GIN2            ;FINISH OLD GROUP
1643
1644 015406  076017                  TABLE1: 76017                   ;CIS INSTRUCTIONS
1645 015410  076032                          76032
1646 015412  076037                          76037
1647 015414  076045                          76045
1648 015416  076047                          76047
1649 015420  076077                          76077
1650 015422  076117                          76117
1651 015424  076132                          76132
1652 015426  076137                          76137
1653 015430  076145                          76145
1654 015432  076147                          76147
1655 015434  076177                          76177
1656 015436  000007                  TABLE:  7
1657 015440  000077                          77
1658 015442  000207                          207                     ;RTS,RT1,JMP
1659 015444  000227                          227
1660 015446  007077                          7077
1661 015450  007777                          7777
1662 015452  075037                          075037
1663 015454  076017                          76017
1664 015456  076032                          76032
1665 015460  076037                          76037
1666 015462  076045                          76045
1667 015464  076047                          76047
1668 015466  076132                          76132
1669 015470  076137                          76137
1670 015472  076145                          76145
1671 015474  076147                          76147
1672 015476  076077                          76077
1673 015500  076117                          76117
1674 015502  106377                          106377
```

```
                                                106477
                                                106677
                                                107777
                                FPP:            167777          ;  START OF THE FPP INSTRUCTIONS
                                                177777
                                FINISH: .                       ;END FLAG
                                INST:   HALT                    ;WILL CONTINUE RESERVED INST
                                        HALT                    ;SHOULD TRAP TO LOC 10
                                        HALT                    ;LOC 10 SHOULD SEND YOU TO
                                        HALT                    ;RET
                                        HALT

                                GIN3:
                                ;*************************************************************************************************
                                ;TEST 114       TEST ILLEGAL HALT
                                ;*************************************************************************************************
                                TST114: INC     @#$TESTN        ;UPDATE TEST NUMBER
                                        CMP     #114,@#$TESTN   ;SEQUENCE ERROR?
                                        BNE     CERIH           ;BR TO ERROR HALT ON SEQ ERROR
                                        MOV     #BUFF,SP        ;STACK POINTER SETUP
                                        CLR     @#CPUERR        ;CLEAR CPU ERROR REGISTER
                                        MOV     #1$,RTRAP5      ;SETUP TRAP RETURN
                                        BIS     #040000,@#PSW   ;GO TO SUPER MODE
                                        HALT                    ;EXECUTE INST UNDER TEST
                                ;FAILURE, NO TRAP
                                        CLRB    @#PSW+1         ;GO BACK TO KERNEL
                                        MOV     #326,@#$FATAL   ;MOVE TO MAILBOX #  *******  326  *******
                                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                        HALT                    ;HALT IN SUPER MODE FAILED TO TRAP
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 755
                                1$:
                                        MOV @#CPUERR,RCPUER     ;READ AND SAVE CPU ERROR REGISTER
                                        BIC #CERMSK,RCPUER      ;MASK OFF UNUSED CPU ERR REG BITS
                                        CMP     #200,RCPUER     ;IS ILLEGAL HALT BIT SET?
                                        BEQ     2$
                                        MOV     #327,@#$FATAL   ;MOVE TO MAILBOX #  *******  327  *******
                                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                        HALT                    ;INCORRECT CPU ERR REG CONTENTS
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 736
                                2$:     CLR     @#CPUERR        ;CLEAR CPU ERR REG
                                        MOV     #3$,RTRAP5      ;SETUP TRAP RETURN
                                        BIS     #140000,@#PSW   ;GO TO USER MODE
                                        HALT
                                ;FAILURE, NO TRAP
                                        CLRB    @#PSW+1         ;GO BACK TO KERNEL
                                        MOV     #330,@#$FATAL   ;MOVE TO MAILBOX #  *******  330  *******
                                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                        HALT                    ;HALT IN USER MODE FAILED TO TRAP
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 716
                                3$:
                                        MOV @#CPUERR,RCPUER     ;SAVE CPU ERROR REGISTER
                                        BIC     #CERMSK,RCPUER  ;MASK OFF UNUSED CPU ERR REG BITS
                                        CMP     #200,RCPUER     ;IS ILLEGAL HALT BIT SET?
                                        BEQ     DONE
```

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.MAIN.  MACRO M1111  27-SEP-79 16:56  PAGE 70-17
T114    TEST ILLEGAL HALT                                                                    SEQ 0060

        015734                                  CERIH:
        015734  012737  000331  000302                  MOV     #331,@#$FATAL   ;MOVE TO MAILBOX #  *******  331  *******
        015742  005212                                  INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        015744  000000                                  HALT                    ;INCORRECT CPU ERR REG CONTENTS
                                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                                ; AND REPLACE NEXT INST W/ 677
  1714  015746                                  DONE:
  1715  015746  005037  177766                         CLR     @#CPUERR
  1716  015752  105037  177777                         CLRB    @#PSW+1         ;GO BACK TO KERNEL MODE
  1717                                  ;*************************************************************************************
                                        ;TEST 115       TEST SPL INST. FOR NOP IN USER/SUPER MODES
                                        ;*************************************************************************************
        015756  005237  000304          TST115: INC     @#$TESTN        ;UPDATE TEST NUMBER
        015762  022737  000115  000304          CMP     #115,@#$TESTN   ;SEQUENCE ERROR?
        015770  001125                          BNE     SEQ             ;BR TO ERROR HALT ON SEQ ERROR
  1718  015772  012706  000500                  MOV     #BUFF,SP        ;SETUP STACK
  1719  015776  052737  040000  177776         BIS     #040000,@#PSW   ;GO TO SUPER MODE
  1720  016004  000277                          SCC                     ;SET CC
  1721  016006  000231                          SPL     1               ;SPL SHOULD=NOP IN USER/SUPER MODES
  1722  016010  000232                          SPL     2
  1723  016012  000233                          SPL     3
  1724  016014  000234                          SPL     4
  1725  016016  000235                          SPL     5
  1726  016020  000236                          SPL     6
  1727  016022  000237                          SPL     7
  1728  016024  013767  177776  000654          MOV     @#PSW,SPSW      ;SAVE PSW
  1729  016032  026727  000650  040017          CMP     SPSW,#040017    ;VARIFY THAT PSW HAS NOT CHANGED
  1730  016040  001407                          BEQ     1$
  1731  016042  105037  177777                  CLRB    @#PSW+1         ;GO BACK TO KERNEL
  1732  016046  012737  000332  000302          MOV     #332,@#$FATAL   ;MOVE TO MAILBOX #  *******  332  *******
        016054  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        016056  000000                          HALT                    ;PRIORTY LEVELS CHANGE
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 744
  1733  016060  012737  040340  177776  1$:     MOV     #040340,@#PSW   ;SET PRIORTY TO 7
  1734  016066  000257                          CCC                     ;CLEAR CONDITION CODES
  1735  016070  000230                          SPL     0               ;SPL SHOULD=NOP IN SUPERVISOR MODE
  1736  016072  013767  177776  000606          MOV     @#PSW,SPSW      ;SAVE PSW
  1737  016100  026727  000602  040340          CMP     SPSW,#040340    ;VARIFY THAT PSW PRIORTY AND CONDITION CODES HAVE NOT CHANGE
  1738  016106  001407                          BEQ     2$
  1739  016110  105037  177777                  CLRB    @#PSW+1         ;GO BACK TO KERNEL
  1740  016114  012737  000333  000302          MOV     #333,@#$FATAL   ;MOVE TO MAILBOX #  *******  333  *******
        016122  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
        016124  000000                          HALT                    ;SPL INSTRUCTION CHANDED PSW SHOULD BE NOP
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 721
  1741  016126  012737  140000  177776  2$:     MOV     #140000,@#PSW   ;GO TO USER MODE
  1742  016134  000277                          SCC                     ;SET CC
  1743  016136  000231                          SPL     1               ;SPL SHOULD=NOP IN USER MODE
  1744  016140  000232                          SPL     2
  1745  016142  000233                          SPL     3
  1746  016144  000234                          SPL     4
  1747  016146  000235                          SPL     5
  1748  016150  000236                          SPL     6
  1749  016152  000237                          SPL     7
  1750  016154  013767  177776  000524          MOV     @#PSW,SPSW      ;SAVE PSW
  1751  016162  026727  000520  140017          CMP     SPSW,#140017    ;VARIFY THAT PSW HAS NOT CHANGED
```

```
                                        BEQ     3$
                                        CLRB    @#PSW+1         ;GO BACK TO KERNEL
                                        MOV     #334,@#$FATAL   ;MOVE TO MAILBOX #  *******  334  *******
                                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                        HALT                    ;PRIORTY LEVELS HAS CHANGED
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 670
                                3$:     MOV     #140340,@#PSW   ;SET PRIORTY TO 7
                                        CCC                     ;CLEAR CONDITION CODES
                                        SPL     0               ;SPL SHOULD=NOP IN USER MODE
                                        MOV     @#PSW,SPSW      ;SAVE PSW
                                        CMP     SPSW,#140340    ;VARIFY THAT PSW PRIORTY AND CONDITION CODES HAVE NOT CHANGE
                                        BEQ     FSPL
                                        CLRB    @#PSW+1         ;GO BACK TO KERNEL
                                SEQ:
                                        MOV     #335,@#$FATAL   ;MOVE TO MAILBOX #  *******  335  *******
                                        INC     (R2)            ;SET MSGTYP TO FATAL ERROR
                                        HALT                    ;SPL INST.CHANGED PSW OR WRONG TEST#
                                                                ; TO SCOPE REPLACE HALT W/ 240
                                                                ; AND REPLACE NEXT INST W/ 645
                                FSPL:
                                        CLRB    @#PSW+1         ;GO BACK TO KERNEL

                                .SBTTL TEST PIRQ LEVELS
                                ;THIS TEST VARIFIES FOR ALL COMBINATIONS OF PIR AND PROCESSOR
                                ;PRIORTY LEVELS THAT REQUESTS ARE GRANTED (TRAP TO 240 OCCURS
                                ;BY THE PROCESSOR,ONLY WHEN THE PIR IS AT A HIGHER LEVEL THAN
                                ;THE PROCESSOR.
                                ;THE CONTENTS OF SPIR,SPSW AND TRP240 SHOULD BE EXAMINED ON ERROR.
                                ;SPIR BITS 2-0 CONTAINS ONE LESS THAN THE PIR REQUEST LEVEL AT
                                ;THE TIME OF ERROR.SPSW BITS 2-0 CONTAINS THE PROCESSOR PRIORTY
                                ;AT THE TIME OF ERROR.TRP240 INDICATES WHETHER OR NOT A TRAP WAS
                                ;EXPECTED (1= EXPECTING TRAP TO 240)
                                ;THE SPL INSTRUCTION IS USED TO SETUP PROCESSOR PRIORTY.
                                ;NOTE: THIS IS THE FIRST REAL TEST OF THE SPL INST.
                                ;ON ERROR,IF EXPECTED PIRQ TRAP DID NOT OCCURE VARIFY SPL
                                ;OPERATION BY COMPARING SPSW BITS<2-0> WITH PSW PRIORTY
                                ;BITS<7-5>.ON ERROR IF AN UNSPECTED PIRQ TRAP OCCURED
                                ;VARIFY SPL OPERATION BY COMPARING SPSW BITS<2-0> WITH
                                ;PROCESSOR PSW<7-5> ON STACK.

                                ;*************************************************************************************
                                ;TEST 116        TEST PIRQ LEVELS AND SPL INSTRUCTION
                                ;*************************************************************************************
                        000304  TST116: INC     @#$TESTN        ;UPDATE TEST NUMBER
                        000116  000304  CMP     #116,@#$TESTN   ;SEQUENCE ERROR?
                                        BNE     PTRP            ;BR TO ERROR HALT ON SEQ ERROR
                        000406          CLR     PIRPSW
                        016642  000000  MOV     #ZTRP,@#0       ;SET LOCATION ZERO TRAP VEC
                        000340  000002  MOV     #340,@#2
                        016656  000004  MOV     #T4TRP,@#4      ;SET UP FAILURE TRAP VEC
                        000340  000006  MOV     #340,@#6
                        016672  000024  MOV     #T24TRP,@#24    ;SETUP POWER FAIL VEC
                        000340  000026  MOV     #340,@#26
                        016604  000240  MOV     #PQTRP,@#PIRVC1 ;SETUP PIRQ VEC
                        000340  000242  MOV     #340,@#PIRVC2   ;SET 242 TO PRIORTY 7
                        000500  MLOOP:  MOV     #BUFF,SP        ;SETUP STACK
```

```
1800 016366  052737  000340  177776          BIS     #340,@#PSW      ;SET PROCESSOR PRIORTY TO 7
1801                                         ;COMPUTE EXPECTED RESULT
1802 016374  016700  000310                  MOV     PIRPSW,R0
1803 016400  042700  177707                  BIC     #177707,R0      ;SETUP SPIR
1804 016404  006200                          ASR     R0
1805 016406  006200                          ASR     R0
1806 016410  006200                          ASR     R0
1807 016412  010067  000266                  MOV     R0,SPIR         ;SAVE R0 IN SPIR
1808 016416  016700  000266                  MOV     PIRPSW,R0
1809 016422  042700  177770                  BIC     #177770,R0      ;SETUP SPSW
1810 016426  010067  000254                  MOV     R0,SPSW
1811 016432  026767  000246  000246          CMP     SPIR,SPSW
1812 016440  002003                          BGE     2$              ;BRANCH IF PIR > PSW
1813 016442  005067  000244                  CLR     TRP240          ;CLEAR FLAG
1814 016446  000403                          BR      3$
1815 016450  012767  177777  000234  2$:     MOV     #177777,TRP240  ;SET FLAG
1816 016456  004767  000232          3$:     JSR     PC,SETPIRQ      ;SETUP PIRQ BASE ON THE # IN SPIR
1817                                         ;SET PSW PRIORTY BASE ON THE # IN SPSW
1818 016462  042767  000007  000006          BIC     #7,1$           ;CLEAR LSB 3 BITS OF SPL INST.AT 1$
1819 016470  056767  000212  000000          BIS     SPSW,1$         ;SET LSB 3 BITS OF SPL INST.TO DESIDED PROC. PRI.
1820 016476  000230                  1$:     SPL     0       ;THE ACTUAL PRIORTY SET INTO THE PSW IS CONTROLLED BY
1821                                                         ;THE PREVIOUS TWO INSTRUCTION.
1822 016500  000240                          NOP
1823 016502  005767  000204                  TST     TRP240
1824 016506  001405                          BEQ     NXTST
     016510  012737  000336  000302          MOV     #336,@#$FATAL   ;MOVE TO MAILBOX #  *******  336  *******
     016516  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     016520  000000                          HALT                    ;EXPECTED PIRQ TRAP BUT DID NOT GET IT
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 717
1825 016522  000240                  NXTST:  NOP                     ;SET UP FOR PASS COUNT
1826
1827
1828 016524  005267  000160                  INC     PIRPSW          ;SETUP FOR NEXT PASS THROUGH LOOP
1829 016530  026727  000154  000070          CMP     PIRPSW,#70
1830 016536  002711                          BLT     MLOOP           ;BRANCH TO MLOOP IF COUNT IS LESS THAN 70
1831 016540  005037  177772                  CLR     @#PIRQ          ;DONE WITH LOOPING PIRQ REQUESTS
1832 016544  012737  000006  000004          MOV #6,@#4              ;RESTORE RETURNS
1833 016552  005037  000006                  CLR     @#6
1834 016556  005037  000000                  CLR     @#0
1835 016562  012737  017432  000024          MOV     #PWRDWN,@#24
1836 016570  012737  000242  000240          MOV     #242,@#240
1837 016576  005037  000242                  CLR     @#242
1838 016602  000542                          BR      END
1839 016604  005767  000102          PQTRP:  TST     TRP240          ;PRIORTY TRAP SERVICE
1840 016610  001344                          BNE     NXTST
     016612  012737  000337  000302          MOV     #337,@#$FATAL   ;MOVE TO MAILBOX #  *******  337  *******
     016620  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     016622  000000                          HALT                    ;EXPECTED NO PIRQ TRAP,BUT GOT ONE
                                                                     ; TO SCOPE REPLACE HALT W/ 240
                                                                     ; AND REPLACE NEXT INST W/ 656
1841 016624  000736                          BR      NXTST
1845 016626                          PTRP:
     016626  012737  000340  000302          MOV     #340,@#$FATAL   ;MOVE TO MAILBOX #  *******  340  *******
     016634  005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     016636  000000                          HALT                    ; WRONG TEST NUMBER
                                                                     ; TO SCOPE REPLACE HALT W/ 240
```

```
                                                                        ; AND REPLACE NEXT INST W/ 616
 1849 016640  000523                            BR      END
 1850 016642                                ZTRP:
 1851 016642  012737  000341  000302             MOV     #341,@#$FATAL   ;MOVE TO MAILBOX #  *******  341  *******
      016650  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
      016652  000000                             HALT                    ;UNSPECTED TRAP TO ZERO OCCURED DURING PIRQ TST
                                                                         ; TO SCOPE REPLACE HALT W/ 240
                                                                         ; AND REPLACE NEXT INST W/ 642
 1852 016654  000722                            BR      NXTST
 1853 016656                                T4TRP:
 1854 016656  012737  000342  000302             MOV     #342,@#$FATAL   ;MOVE TO MAILBOX #  *******  342  *******
      016664  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
      016666  000000                             HALT                    ;UNSPECTED TRAP TO 4 DURING PIRQ TESTING
                                                                         ; TO SCOPE REPLACE HALT W/ 240
                                                                         ; AND REPLACE NEXT INST W/ 634
 1855 016670  000714                            BR      NXTST
 1856 016672                                T24TRP:
 1857 016672  012737  000343  000302             MOV     #343,@#$FATAL   ;MOVE TO MAILBOX #  *******  343  *******
      016700  005212                             INC     (R2)            ;SET MSGTYP TO FATAL ERROR
      016702  000000                             HALT                    ;UNSPECTED POWER FAIL TRAP DURING PIRQ TESTING
                                                                         ; TO SCOPE REPLACE HALT W/ 240
                                                                         ; AND REPLACE NEXT INST W/ 626
 1858 016704  000000                        SPIR:   .WORD   0
 1859 016706  000000                        SPSW:   .WORD   0
 1860 016710  000000                        PIRPSW: .WORD   0
```

```
1862            177772                          PIRQ=177772
1863            000240                          PIRVC1=240
1864            000242                          PIRVC2=242
1865 016712     000000                          TRP240: .WORD   0
1866
1867
1868 016714                             SETPIRQ:
1869 016714     026727  177764  000000          CMP     SPIR,#0
1870 016722     001435                          BEQ     1$
1871 016724     026727  177754  000001          CMP     SPIR,#1
1872 016732     001435                          BEQ     2$
1873 016734     026727  177744  000002          CMP     SPIR,#2
1874 016742     001435                          BEQ     3$
1875 016744     026727  177734  000003          CMP     SPIR,#3
1876 016752     001435                          BEQ     4$
1877 016754     026727  177724  000004          CMP     SPIR,#4
1878 016762     001435                          BEQ     5$
1879 016764     026727  177714  000005          CMP     SPIR,#5
1880 016772     001435                          BEQ     6$
1881 016774     026727  177704  000006          CMP     SPIR,#6
1882 017002     001435                          BEQ     7$
1883 017004     012737  000344  000302          MOV     #344,@#$FATAL   ;MOVE TO MAILBOX #  *******  344  *******
     017012     005212                          INC     (R2)            ;SET MSGTYP TO FATAL ERROR
     017014     000000                          HALT                    ;# IN SPIR DOES NOT MAKE SENSE OR SPIR NOT=0-6
                                                                        ; TO SCOPE REPLACE HALT W/ 240
                                                                        ; AND REPLACE NEXT INST W/ 561
1884 017016     012737  001000  177772  1$:     MOV     #1000,@#PIRQ
1885 017024     000430                          BR      10$
1886 017026     012737  002000  177772  2$:     MOV     #2000,@#PIRQ
1887 017034     000424                          BR      10$
1888 017036     012737  004000  177772  3$:     MOV     #4000,@#PIRQ
1889 017044     000420                          BR      10$
1890 017046     012737  010000  177772  4$:     MOV     #10000,@#PIRQ
1891 017054     000414                          BR      10$
1892 017056     012737  020000  177772  5$:     MOV     #20000,@#PIRQ
1893 017064     000410                          BR      10$
1894 017066     012737  040000  177772  6$:     MOV     #40000,@#PIRQ
1895 017074     000404                          BR      10$
1896 017076     012737  100000  177772  7$:     MOV     #100000,@#PIRQ
1897 017104     000400                          BR      10$
1898 017106     000207                  10$:     RTS     PC
1899
1900
1901                                            ;TABLE FOR PIRQ SETUP
1902                                            ;SPIR   PIR LEVEL       SETPIRQ         # LOADED INTO PIRQ REG R0
1903                                            ;0000       1           BIT9            1000
1904                                            ;0001       2           BIT10           2000
1905                                            ;0002       3           BIT11           4000
1906                                            ;0003       4           BIT12           10000
1907                                            ;0004       5           BIT13           20000
1908                                            ;0005       6           BIT14           40000
1909                                            ;0006       7           BIT15           100000
1910 017110                             END:
1911 017110     005237  000306                  INC     @#$PASS
1912 017114     105267  000100                  INCB    PASSPT          ;SHOULD PRINT THIS PASS?
1913 017120     001020                          BNE     ACT             ;NO
1914 017122     132767  000040  161171          BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
```

```
 1915 017130  001014                          BNE     ACT             ;NO
 1916 017132  023727  000042  017172          CMP     @#42,#$ENDAD
 1917 017140  001410                          BEQ     ACT
 1918 017142  012700  017222                  MOV     #MSG,R0         ;GET MSG ADDR.
 1919 017146  004767  000346                  JSR     PC,PRTMSG       ;PRINT MESSAGE POINTED TO BY R0
 1920 017152  000005                          RESET
 1921 017154  012767  177761  000036          MOV     #177761,PASSPT  ;DO IT ABOUT 15 DECIMAL TIMES
 1922 017162  013700  000042          ACT:    MOV     @#42,R0         ;CHECK ACT
 1923 017166  001405                          BEQ     GOAGIN          ;KEEP GOING
 1924 017170  000005                          RESET
 1925 017172  004710                  $ENDAD: JSR     PC,(R0)         ;ACT HOOKS
 1926 017174  000240                          NOP
 1927 017176  000240                          NOP
 1928 017200  000240                          NOP
 1929 017202  012767  000012  160600  GOAGIN: MOV     #12,10
 1930 017210  005067  160576                  CLR     12
 1931 017214  000167  161434                  JMP     RESTRT          ;DO NEXT PASS
 1932 017220  177777                  PASSPT: -1
 1933 017222     015     012     105  MSG:    .ASCIZ  <15><12>.END OF CKKABA0 11/44 TRAPS.
      017225     116     104     040
      017230     117     106     040
      017233     103     113     113
      017236     101     102     101
      017241     060     040     061
      017244     061     057     064
      017247     064     040     124
      017252     122     101     120
      017255     123     000
 1934 017257     015     012     103  PNAME:  .ASCIZ <15><12>+CKKABA0 11/44 TRAPS+
      017262     113     113     101
      017265     102     101     060
      017270     040     061     061
      017273     057     064     064
      017276     040     124     122
      017301     101     120     123
      017304     000
 1935 017305     015     012     103  TITLE:  .ASCIZ <15><12>+CKKABA0 11/44 TRAPS+<15><12>
      017310     113     113     101
      017313     102     101     060
      017316     040     061     061
      017321     057     064     064
      017324     040     124     122
      017327     101     120     123
      017332     015     012     000
 1936 017335     015     012     116  MSGNFP: .ASCIZ  <15><12>.NO FLOATING POINT OPTION PRESENT.
      017340     117     040     106
      017343     114     117     101
      017346     124     111     116
      017351     107     040     120
      017354     117     111     116
      017357     124     040     117
      017362     120     124     111
      017365     117     116     040
      017370     120     122     105
      017373     123     105     116
      017376     124     000
 1937 017400     015     012     116  MSGNCIS:.ASCIZ  <15><12>.NO CIS OPTION PRESENT .
```

```
        017403     117     040     103
        017406     111     123     040
        017411     117     120     124
        017414     111     117     116
        017417     040     120     122
        017422     105     123     105
        017425     116     124     040
        017430     000
  1938                                          .EVEN
  1939 017432  012767  017442  160364  PWRDWN: MOV     #PWRUP,24
  1940 017440  000000                          HALT
  1941
  1942 017442  012767  017432  160354  PWRUP:  MOV     #PWRDWN,24
  1943 017450  012706  000500                  MOV     #BUFF,SP
  1944 017454  132767  000040  160637          BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
  1945 017462  001004                          BNE     PFRES           ;NO
  1946 017464  012700  017500                  MOV     #MSGPWF,R0      ;GET MSG ADDR.
  1947 017470  004767  000024                  JSR     PC,PRTMSG       ;PRINT MESSAGE POINTED TO BY R0
  1948 017474  000167  161154          PFRES:  JMP     RESTRT
  1949 017500     015     012     120  MSGPWF: .ASCIZ   <15><12>.POWER FAILED!.
        017503     117     127     105
        017506     122     040     106
        017511     101     111     114
        017514     105     104     041
        017517     000
  1950
  1951                                  ;SUBROUTINE TO PRINT MESSAGE
  1952                                  ;
  1953 017520  132767  000040  160573  PRTMSG: BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
  1954 017526  001011                          BNE     1$              ;BRANCH IF NO
  1955 017530  105737  177564          2$:     TSTB    @#TPS           ;TTY READY
  1956 017534  100375                          BPL     2$              ;NO WAIT
  1957 017536  112037  177566                  MOVB    (R0)+,@#TPB     ;PRINT CHARACTER
  1958 017542  001372                          BNE     2$              ;NEXT IF NOT DONE.
  1959 017544  105737  177564          3$:     TSTB    @#TPS
  1960 017550  100375                          BPL     3$
  1961 017552  000207                  1$:     RTS     PC
  1962         000001                          .END
```

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SYMBOL TABLE

SEQ 0067

```
ABASE = 000000        BEGIN   000622        FPP     015512        PIRPSW  016710        RETF    002634
ACDW1 = 000000        BELL  = 000240        FSPL    016256        PIRQ  = 177772        RETF1   003460
ACDW2 = 000000        BR1     001032        GIN1    015246        PIRVC1= 000240        RETF2   004360
ACPUOP= 000000        BR10    001264        GIN2    015264        PIRVC2= 000242        RETF3   005174
ACT     017162        BR11    001400        GIN3    015532        PNAME   017257        RETF4   006070
ADALL   013240        BR12    001450        GOAGIN  017202        PQTRP   016604        RETF5   006704
ADDW0 = 000000        BR13    001520        HERE  = 000000        PROFTE  013642        RETG    002760
ADDW1 = 000000        BR14    001570        HLT   = 000000        PRTMSG  017520        RETG1   003604
ADDW10= 000000        BR15    001676        ILLA  = 004700        PSW   = 177776        RETG2   004504
ADDW11= 000000        BR16    001720        ILLB  = 000100        PTRP    016626        RETG3   005320
ADDW12= 000000        BR17    001742        INST    015520        PWRDWN  017432        RETG4   006214
ADDW13= 000000        BR2     001062        INSTC   002426        PWRUP   017442        RETG5   007030
ADDW14= 000000        BR20    001764        INSTK   007274        RA      005474        RETH5   007176
ADDW15= 000000        BR21    002006        KPAR0   000600        RA1     003764        RETJ    007226
ADDW2 = 000000        BR22    002030        KPAR1   000602        RB      005460        RETK    007276
ADDW3 = 000000        BR23    002052        KPAR2   000604        RB1     003750        RETL    007356
ADDW4 = 000000        BR3     001106        KPAR3   000606        RC      005454        RETM    007424
ADDW5 = 000000        BR33    002132        KPAR4   000610        RCPUER  000502        RETN    007502
ADDW6 = 000000        BR34    002146        KPAR5   000612        RC1     003744        RETO    007624
ADDW7 = 000000        BR35    002162        KPAR6   000614        RESET2  014462        RETP    010020
ADDW8 = 000000        BR36    002176        KPAR7   000616        RESET3  014450        RETQ    010114
ADDW9 = 000000        BR37    002222        KPDR0   000560        RESTRT  000654        RETR    010166
ADEVCT= 000000        BR4     001134        KPDR1   000562        RET     015312        RETS    010250
ADEVM = 000000        BR40    002236        KPDR2   000564        RETA    002316        RETT    010320
ADJNC   015232        BR41    002252        KPDR3   000566        RETAH   002330        RETU    010400
ADREND  000620        BR45    003752        KPDR4   000570        RETAT   012052        RETV    010526
ADRTAB  000520        BR46    004602        KPDR5   000572        RETA1   003156        RET1    015332
AENV  = 000000        BR46A   004614        KPDR6   000574        RETA2   004054        RET2    015354
AENVM = 000000        BR47    005462        KPDR7   000576        RETA3   004670        RET3    015374
AFATAL= 000000        BR5     001162        KTSTA   000516        RETA4   005564        RET4    015362
AMADR1= 000000        BR51    006312        KTVEC   000514        RETA5   006400        RTI1    012462
AMADR2= 000000        BR51A   006324        K1      000744        RETB    002360        RTI2    012476
AMADR3= 000000        BR6     001210        K10     000762        RETBT   012126        RTRAP = 000010
AMADR4= 000000        BR60    012664        K11     000764        RETB1   003206        RTRAP1= 000034
AMAMS1= 000000        BR7     001236        K12     000766        RETB2   004104        RTRAP2= 000020
AMAMS2= 000000        BR70    013074        K2      000746        RETB3   004720        RTRAP3= 000030
AMAMS3= 000000        BR71    014130        K3      000750        RETB4   005614        RTRAP4= 000014
AMAMS4= 000000        BTRAP   013452        K4      000752        RETB5   006430        RTRAP5= 000004
AMSGAD= 000000        BUFF    000500        K5      000754        RETC    002430        RTT1    012272
AMSGLG= 000000        CC    = 177776        K6      000756        RETCT   012206        RTT2    012310
AMSGTY= 000000        CERIH   015734        K7      000760        RETC1   003256        RTT3    012356
AMTYP1= 000000        CERMSK= 177413        LAST  =%000001        RETC2   004154        RTT4    012376
AMTYP2= 000000        CERR1   010056        MLOOP   016362        RETC3   004770        RTT5    012330
AMTYP3= 000000        CERR2   010736        MSG     017222        RETC4   005664        RTT6    012420
AMTYP4= 000000        CORH    013236        MSGNCI  017400        RETC5   006500        R6    =%000006
APASS = 000000        CPUERR= 177766        MSGNFP  017335        RETD    002510        R7TRX   014004
APRIOR= 000000        CTRAP   013406        MSGPWF  017500        RETD1   003336        R7TR1   012560
AROUND  015220        DL11W   013644        NODL    014142        RETD2   004234        R7TR2   012630
ASWREG= 000000        DL11W1  013650        NODL1   014300        RETD3   005050        R7TR2A  012616
ATESTN= 000000        DONE    015746        NODL2   014404        RETD4   005744        R7TR3   012700
ATRAP   013306        DTRAP   013426        NODL3   014654        RETD5   006560        R7TR4   012752
AUNIT = 000000        END     017110        NODL4   015046        RETE    002556        SEQ     016244
AUSWR = 000000        ERRP1   010044        NOP   = 000240        RETE1   003402        SETPIR  016714
AUTO    013274        ERRP2   010724        NOR     013260        RETE2   004302        SPIR    016704
AUTO1   013572        FINISH  015516        NXTST   016522        RETE3   005116        SPSW    016706
AVECT1= 000000        FIRST =%000005        PASSPT  017220        RETE4   006012        SR0     000504
AVECT2= 000000        FOVER   011752        PFRES   017474        RETE5   006626        SR0H    000506
```

.MAIN. MACRO M1111 27-SEP-79 16:56 PAGE 71-4
SYMBOL TABLE

SEQ 0068

```
SR1      000510          TSFCIS  015142          TST34   005564          TTCSR = 177564          WATE3   014764
SR2      000512          TSL     013234          TST35   005634          TTT37   014650          WATE4   015042
STATUS= 177776           TST1    000770          TST36   005706          TTY11   014636          WATE5   015030
STP      011764          TST10   002452          TST37   006034          TTY3    014554          ZTRP    016642
STPP     003056          TST100  012514          TST4    002074          TTY4    014630          $APTHD  000330
STPPA    003070          TST101  013002          TST40   006336          T24TRP  016672          $CPUOP  000326
STP3     013176          TST102  013122          TST41   006400          T4TRP   016656          $DEVCT  000310
STP3D    013210          TST103  013216          TST42   006450          UPAR0   000540          $ENDAD  017172
TAB    =%000003          TST104  013656          TST43   006522          UPAR1   000542          $ENV    000320
TABLE    015436          TST105  014004          TST44   006650          UPAR2   000544          $ENVM   000321
TABLE1   015406          TST106  014142          TST45   007134          UPAR3   000546          $ERN  = 000345
TDEC1    010700          TST107  014300          TST46   007176          UPAR4   000550          $ERROR= 000302
TDEC2    010772          TST11   002600          TST47   007246          UPAR5   000552          $ETABL  000320
TDEC3    011046          TST110  014404          TST5    002266          UPAR6   000554          $ETEND  000330
TDEC4    011120          TST111  014500          TST50   007320          UPAR7   000556          $FATAL  000302
TDEC6    011134          TST112  014654          TST51   007446          UPDR0   000520          $HIBTS  000330
TDEC7    011146          TST113  015046          TST52   007730          UPDR1   000522          $MAIL   000300
TDEC77   013766          TST114  015532          TST53   010062          UPDR2   000524          $MBADR  000332
TDEC8    013754          TST115  015756          TST54   010134          UPDR3   000526          $MSGAD  000314
TENSAV   015140          TST116  016262          TST55   010210          UPDR4   000530          $MSGLG  000316
TITLE    017305          TST12   003102          TST56   010342          UPDR5   000532          $MSGTY  000300
TNCIS    015170          TST13   003156          TST57   010632          UPDR6   000534          $PASS   000306
TONT1    013106          TST14   003226          TST6    002330          UPDR7   000536          $PASTM  000336
TPB    = 177566          TST15   003300          TST60   010742          VDEC1   011216          $SVPC = 000300
TPS    = 177564          TST16   003424          TST61   011012          VDEC10  011474          $SWR  = 000000
TRACE    013062          TST17   003714          TST62   011146          VDEC11  011552          $SWREG  000322
TRAPA  = 000010          TST2    001314          TST63   011224          VDEC12  011564          $TESTN  000304
TRAPB    013604          TST20   004012          TST64   011302          VDEC13  011650          $TN   = 000117
TRAP10   015120          TST21   004054          TST65   011360          VDEC14  011662          $TSTM   000334
TRAP24   015110          TST22   004124          TST66   011436          VDEC2   011204          $TSTNM= 000304
TRCSR  = 177560          TST23   004176          TST67   011514          VDEC3   011274          $UNIT   000312
TRC1     013166          TST24   004324          TST7    002400          VDEC4   011262          $UNITM  000340
TRP240   016712          TST25   004626          TST70   011612          VDEC5   011352          $USWR   000324
TRT    = 000003          TST26   004670          TST71   011670          VDEC6   011340          $X    = 016362
TR0      014104          TST27   004740          TST72   011776          VDEC7   011430          $XX   = 177562
TR2      014116          TST3    001640          TST73   012052          VDEC8   011416          $XXX  = 000561
TR3      014236          TST30   005012          TST74   012146          VDEC9   011506          $Y    = 016276
TR4      014252          TST31   005140          TST75   012230          WATE    015000          $YY   = 016362
TR4A     012740          TST32   005424          TST76   012310          WATE1   014722          .$X   = 000330
TR5      014240          TST33   005522          TST77   012420          WATE2   014736

. ABS.   017554      000
         000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  58289 WORDS  ( 228 PAGES)
DYNAMIC MEMORY:  20434 WORDS  ( 78 PAGES)
ELAPSED TIME:  00:05:03
CKKABA0,CKKABA0/NL:TOC/-SP/CRF=CKKABA0.SML,CKKABA0.P11
```

CKKABAO CREATED BY MACRO ON 27-SEP-79 AT 16:58 PAGE 1
SYMBOL CROSS REFERENCE CREF SEQ 0069

SYMBOL		VALUE	REFERENCES			
ABASE	=	000000	67-445			
ACDW1	=	000000	67-445			
ACDW2	=	000000	67-445			
ACPUOP	=	000000	67-445	67-445		
ACT		017162	71-1913	71-1915	71-1917	#71-1922
ADALL		013240	70-1392	#70-1395		
ADDW0	=	000000	67-445			
ADDW1	=	000000	67-445			
ADDW10	=	000000	67-445			
ADDW11	=	000000	67-445			
ADDW12	=	000000	67-445			
ADDW13	=	000000	67-445			
ADDW14	=	000000	67-445			
ADDW15	=	000000	67-445			
ADDW2	=	000000	67-445			
ADDW3	=	000000	67-445			
ADDW4	=	000000	67-445			
ADDW5	=	000000	67-445			
ADDW6	=	000000	67-445			
ADDW7	=	000000	67-445			
ADDW8	=	000000	67-445			
ADDW9	=	000000	67-445			
ADEVCT	=	000000	67-445	67-445		
ADEVM	=	000000	67-445			
ADJNC		015232	70-1605	#70-1618		
ADREND		000620	#67-495			
ADRTAB		000520	#67-459			
AENV	=	000000	67-445	67-445		
AENVM	=	000000	67-445	67-445		
AFATAL	=	000000	67-445	67-445		
AMADR1	=	000000	67-445			
AMADR2	=	000000	67-445			
AMADR3	=	000000	67-445			
AMADR4	=	000000	67-445			
AMAMS1	=	000000	67-445			
AMAMS2	=	000000	67-445			
AMAMS3	=	000000	67-445			
AMAMS4	=	000000	67-445			
AMSGAD	=	000000	67-445	67-445		
AMSGLG	=	000000	67-445	67-445		
AMSGTY	=	000000	67-445	67-445		
AMTYP1	=	000000	67-445			
AMTYP2	=	000000	67-445			
AMTYP3	=	000000	67-445			
AMTYP4	=	000000	67-445			
APASS	=	000000	67-445	67-445		
APRIOR	=	000000	67-445			
AROUND		015220	70-1599	#70-1615		
ASWREG	=	000000	67-445	67-445		
ATESTN	=	000000	67-445	67-445		
ATRAP		013306	70-1398	#70-1405		
AUNIT	=	000000	67-445	67-445		

SYMBOL	VALUE	REFERENCES								
AUSWR	= 000000	67-445	67-445							
AUTO	013274	#70-1403								
AUTO1	013572	70-1389	#70-1446							
AVECT1	= 000000	67-445								
AVECT2	= 000000	67-445								
BEGIN	000622	67-439	67-442	#68-502						
BELL	= 000240	#66-353								
BR1	001032	68-539	#68-541							
BR10	001264	68-578	#68-580							
BR11	001400	68-592	#68-594							
BR12	001450	68-600	#68-602							
BR13	001520	68-608	#68-610							
BR14	001570	68-616	#68-618							
BR15	001676	68-628	#68-630							
BR16	001720	68-631	#68-633							
BR17	001742	68-634	#68-636							
BR2	001062	68-544	#68-546							
BR20	001764	68-637	#68-638							
BR21	002006	68-639	#68-641							
BR22	002030	68-642	#68-644							
BR23	002052	68-645	#68-647							
BR3	001106	68-549	#68-551							
BR33	002132	68-655	#68-656							
BR34	002146	68-656	#68-657							
BR35	002162	68-657	#68-658							
BR36	002176	68-658	#68-659							
BR37	002222	68-662	#68-663							
BR4	001134	68-555	#68-557							
BR40	002236	68-663	#68-664							
BR41	002252	68-664	#68-665							
BR45	003752	68-794	#68-799							
BR46	004602	68-838	#68-862							
BR46A	004614	68-862	#68-863							
BR47	005462	68-922	#68-927							
BR5	001162	68-561	#68-563							
BR51	006312	68-968	#68-992							
BR51A	006324	68-992	#68-993							
BR6	001210	68-567	#68-568							
BR60	012664	#70-1347	70-1349							
BR7	001236	68-572	#68-574							
BR70	013074	70-1360	#70-1372							
BR71	014130	70-1483	#70-1490							
BTRAP	013452	70-1420	#70-1431							
BUFF	000500	#67-451	68-667	68-674	68-677	68-681	68-684	68-688	68-693	68-695
		68-700	68-704	68-715	68-734	68-740	68-743	68-747	68-750	68-754
		68-759	68-761	68-765	68-769	68-780	68-797	68-806	68-812	68-815
		68-818	68-821	68-824	68-829	68-831	68-836	68-839	68-850	68-866
		68-872	68-875	68-878	68-881	68-884	68-889	68-891	68-896	68-899
		68-910	68-925	68-935	68-941	68-944	68-947	68-950	68-953	68-958
		68-961	68-966	68-969	68-980	68-1003	68-1009	68-1012	68-1015	68-1018
		68-1021	68-1026	68-1028	68-1033	68-1036	68-1047	68-1060	68-1066	68-1069
		68-1072	68-1075	68-1079	68-1084	68-1086	69-1092	69-1095	69-1106	69-1123

SYMBOL	VALUE	REFERENCES								
		69-1135	69-1138	69-1141	69-1144	69-1147	69-1152	69-1154	69-1159	69-1162
		69-1173	70-1260	70-1269	70-1276	70-1279	70-1285	70-1291	70-1303	70-1319
		70-1332	70-1336	70-1339	70-1343	70-1345	70-1349	70-1352	70-1358	70-1362
		70-1376	70-1382	70-1399	70-1421	70-1445	70-1452	70-1479	70-1496	70-1524
		70-1540	70-1548	70-1562	70-1577	70-1627	70-1632	70-1635	70-1638	70-1689
		70-1718	70-1799	71-1943						
CC	= 177776	#66-360	*68-690	*68-697	68-713	68-724	*68-756	*68-763	68-778	68-789
		*68-826	*68-833	68-848	68-859	*68-886	*68-893	68-908	68-920	*68-955
		*68-963	68-978	68-989	*68-1023	*68-1030	68-1045	68-1056	*68-1081	*68-1088
		69-1104	69-1115	*69-1149	*69-1156	69-1171	69-1182	*70-1628		
CERIH	015734	70-1688	#70-1713							
CERMSK	= 177413	#66-362	69-1129	69-1193	70-1407	70-1435	70-1699	70-1711		
CERR1	010056	69-1131	#69-1132							
CERR2	010736	69-1195	#69-1196							
CORH	013236	#70-1394	*70-1405	70-1424						
CPUERR	= 177766	#66-361	69-1120	69-1121	69-1128	69-1132	69-1186	69-1192	69-1196	70-1396
		70-1406	70-1419	70-1434	70-1690	70-1698	70-1702	70-1710	70-1715	
CTRAP	013406	#70-1419	70-1446							
DL11W	013644	70-1453	#70-1457							
DL11W1	013650	70-1455	#70-1458							
DONE	015746	70-1713	#70-1714							
DTRAP	013426	#70-1423	70-1445							
END	017110	70-1838	70-1849	#71-1910						
ERRP1	010044	69-1119	#69-1131							
ERRP2	010724	69-1185	#69-1195							
FINISH	015516	*70-1589	70-1622	#70-1680						
FIRST	=%000005	#66-340	*70-1620	70-1622	70-1624					
FOVER	011752	70-1243	70-1245	#70-1256						
FPP	015512	70-1589	#70-1678							
FSPL	016256	70-1760	#70-1763							
GIN1	015246	#70-1620	70-1641							
GIN2	015264	#70-1625	70-1642							
GIN3	015532	70-1623	#70-1687							
GOAGIN	017202	71-1923	#71-1929							
HERE	= 000000	#68-521	*68-537	*68-542	68-581					
HLT	= 000000	#66-342								
ILLA	= 004700	#66-358	70-1238							
ILLB	= 000100	#66-359	70-1241							
INST	015520	*70-1624	*70-1625	70-1629	70-1635	70-1640	#70-1681			
INSTC	002426	#68-683								
INSTK	007274	#68-1074	68-1075							
KPAR0	000600	#67-487								
KPAR1	000602	#67-488								
KPAR2	000604	#67-489								
KPAR3	000606	#67-490								
KPAR4	000610	#67-491								
KPAR5	000612	#67-492								
KPAR6	000614	#67-493								
KPAR7	000616	#67-494								
KPDR0	000560	#67-478								
KPDR1	000562	#67-479								
KPDR2	000564	#67-480								

SYMBOL	VALUE	REFERENCES								
KPDR3	000566	#67-481								
KPDR4	000570	#67-482								
KPDR5	000572	#67-483								
KPDR6	000574	#67-484								
KPDR7	000576	#67-485								
KTSTA	000516	#67-458								
KTVEC	000514	#67-457								
K1	000744	#68-524	*68-587	68-588	68-591	*68-595	68-596	68-599	*68-602	68-604
		*68-610	68-612	*68-618	68-620	68-623				
K10	000762	#68-531	68-633	68-636	68-638	68-641	68-641	68-644	68-644	68-647
K11	000764	#68-532								
K12	000766	#68-533								
K2	000746	#68-525								
K3	000750	#68-526								
K4	000752	#68-527								
K5	000754	#68-528	*68-586	68-589	*68-594	*68-603	68-605	68-607	*68-611	68-613
		68-615	*68-619	68-621						
K6	000756	#68-529	68-597	68-636						
K7	000760	#68-530	68-627	68-627	68-630	68-630	68-633	68-638	68-647	
LAST	=%000001	#66-339	*70-1621	70-1640						
MLOOP	016362	#70-1799	70-1830							
MSG	017222	71-1918	#71-1933							
MSGNCI	017400	70-1610	#71-1937							
MSGNFP	017335	70-1594	#71-1936							
MSGPWF	017500	71-1946	#71-1949							
NODL	014142	70-1478	#70-1492							
NODL1	014300	70-1495	#70-1510							
NODL2	014404	70-1514	#70-1522							
NODL3	014654	70-1538	#70-1556							
NODL4	015046	70-1560	#70-1580							
NOP	= 000240	#66-354								
NOR	013260	#70-1399	70-1402							
NXTST	016522	70-1824	#70-1825	70-1840	70-1841	70-1852	70-1855			
PASSPT	017220	68-503	*71-1912	*71-1921	#71-1932					
PFRES	017474	71-1945	#71-1948							
PIRPSW	016710	*70-1785	70-1802	70-1808	*70-1828	70-1829	#70-1860			
PIRQ	= 177772	70-1831	#71-1862	71-1884	71-1886	71-1888	71-1890	71-1892	71-1894	71-1896
PIRVC1	= 000240	70-1792	#71-1863							
PIRVC2	= 000242	70-1793	#71-1864							
PNAME	017257	#71-1934								
PQTRP	016604	70-1792	#70-1839							
PROFTE	013642	*70-1451	#70-1456	*70-1457	70-1461	70-1477	70-1494	70-1513	70-1537	70-1559
PRTMSG	017520	68-507	70-1595	70-1611	71-1919	71-1947	#71-1953			
PSW	= 177776	#66-363	70-1692	70-1695	70-1704	70-1707	70-1716	70-1719	70-1728	70-1731
		70-1733	70-1736	70-1739	70-1741	70-1750	70-1753	70-1755	70-1758	70-1761
		70-1764	70-1800							
PTRP	016626	70-1784	#70-1845							
PWRDWN	017432	68-510	70-1835	#71-1939	71-1942					
PWRUP	017442	71-1939	#71-1942							
RA	005474	68-924	#68-928							
RA1	003764	68-796	#68-800							
RB	005460	*68-923	#68-926	*68-928	68-929					

SYMBOL	VALUE	REFERENCES								
RB1	003750	*68-795	#68-798	*68-800	68-801					
RC	005454	#68-925	68-930							
RCPUER	000502	#67-452	*69-1128	*69-1129	69-1130	*69-1192	*69-1193	69-1194	*70-1406	*70-1407
		70-1412	70-1415	*70-1434	*70-1435	70-1440	70-1443	*70-1698	*70-1699	70-1700
		*70-1710	*70-1711	70-1712						
RC1	003744	#68-797	68-802							
RESET2	014462	70-1525	#70-1532							
RESET3	014450	70-1523	#70-1531							
RESTRT	000654	68-505	#68-508	71-1931	71-1948					
RET	015312	70-1626	#70-1632							
RETA	002316	68-666	#68-670							
RETAH	002330	68-668	#68-671							
RETAT	012052	70-1261	#70-1267							
RETA1	003156	68-735	#68-738							
RETA2	004054	68-807	#68-810							
RETA3	004670	68-867	#68-870							
RETA4	005564	68-936	#68-939							
RETA5	006400	68-1004	#68-1007							
RETB	002360	68-675	#68-677							
RETBT	012126	70-1270	#70-1276							
RETB1	003206	68-741	#68-743							
RETB2	004104	68-813	#68-815							
RETB3	004720	68-873	#68-875							
RETB4	005614	68-942	#68-944							
RETB5	006430	68-1010	#68-1012							
RETC	002430	68-682	#68-684							
RETCT	012206	70-1280	#70-1285							
RETC1	003256	68-748	#68-750							
RETC2	004154	68-819	#68-821							
RETC3	004770	68-879	#68-881							
RETC4	005664	68-948	#68-950							
RETC5	006500	68-1016	#68-1018							
RETD	002510	68-689	#68-693							
RETD1	003336	68-755	#68-759							
RETD2	004234	68-825	#68-829							
RETD3	005050	68-885	#68-889							
RETD4	005744	68-954	#68-958							
RETD5	006560	68-1022	#68-1026							
RETE	002556	68-696	#68-700							
RETE1	003402	68-762	#68-765							
RETE2	004302	68-832	#68-836							
RETE3	005116	68-892	#68-896							
RETE4	006012	68-962	#68-966							
RETE5	006626	68-1029	#68-1033							
RETF	002634	68-705	#68-708							
RETF1	003460	68-770	#68-773							
RETF2	004360	68-840	#68-843							
RETF3	005174	68-900	#68-903							
RETF4	006070	68-970	#68-973							
RETF5	006704	68-1037	#68-1040							
RETG	002760	68-716	#68-719							
RETG1	003604	68-781	#68-784							

SYMBOL	VALUE	REFERENCES								
RETG2	004504	68-851	#68-854							
RETG3	005320	68-911	#68-914							
RETG4	006214	68-981	#68-984							
RETG5	007030	68-1048	#68-1051							
RETH5	007176	68-1061	#68-1064							
RETJ	007226	68-1067	#68-1069							
RETK	007276	68-1073	#68-1075							
RETL	007356	68-1080	#68-1084							
RETM	007424	68-1087	#69-1092							
RETN	007502	69-1096	#69-1099							
RETO	007624	69-1107	#69-1110							
RETP	010020	69-1124	#69-1127							
RETQ	010114	69-1136	#69-1138							
RETR	010166	69-1142	#69-1144							
RETS	010250	69-1148	#69-1152							
RETT	010320	69-1155	#69-1159							
RETU	010400	69-1163	#69-1166							
RETV	010526	69-1174	#69-1177							
RET1	015332	70-1633	#70-1635							
RET2	015354	70-1636	#70-1638							
RET3	015374	70-1639	#70-1640							
RET4	015362	70-1582	#70-1639							
RTI1	012462	70-1321	#70-1325							
RTI2	012476	70-1322	#70-1327							
RTRAP	= 000010	#66-357	*68-668	*68-675	*68-682	*68-689	*68-696	*68-705	*68-706	*68-716
		*68-717	*68-1004	*68-1010	*68-1016	*68-1022	*68-1029	*68-1037	*68-1038	*68-1048
		*68-1049	*68-1061	*68-1067	*68-1073	*68-1080	*68-1087	*69-1096	*69-1097	*69-1107
		*69-1108								
RTRAP1	= 000034	#66-348	*68-735	*68-741	*68-748	*68-755	*68-762	*68-770	*68-771	*68-781
		*68-782								
RTRAP2	= 000020	#66-347	*68-807	*68-813	*68-819	*68-825	*68-832	*68-840	*68-841	*68-851
		*68-852								
RTRAP3	= 000030	#66-346	*68-867	*68-873	*68-879	*68-885	*68-892	*68-900	*68-901	*68-911
		*68-912								
RTRAP4	= 000014	#66-345	*68-936	*68-942	*68-948	*68-954	*68-962	*68-970	*68-971	*68-981
		*68-982	*70-1261	*70-1270	*70-1280					
RTRAP5	= 000004	#66-344	*69-1124	*69-1136	*69-1142	*69-1148	*69-1155	*69-1163	*69-1164	*69-1174
		*69-1175	*70-1691	*70-1703						
RTT1	012272	70-1294	#70-1297							
RTT2	012310	70-1295	#70-1300							
RTT3	012356	70-1305	#70-1309							
RTT4	012376	70-1306	#70-1313							
RTT5	012330	#70-1303	70-1311	70-1316						
RTT6	012420	70-1314	#70-1317							
R6	=%000006	#66-337	*70-1526	*70-1527						
R7TRX	014004	70-1462	#70-1475							
R7TR1	012560	70-1333	#70-1336							
R7TR2	012630	70-1340	#70-1343							
R7TR2A	012616	#70-1342	70-1343							
R7TR3	012700	70-1346	#70-1349							
R7TR4	012752	70-1353	#70-1357							
SEQ	016244	70-1717	#70-1762							

SYMBOL	VALUE	REFERENCES								
SETPIR	016714	70-1816	#71-1868							
SPIR	016704	*70-1807	70-1811	#70-1858	71-1869	71-1871	71-1873	71-1875	71-1877	71-1879
		71-1881								
SPSW	016706	*70-1728	70-1729	*70-1736	70-1737	*70-1750	70-1751	*70-1758	70-1759	*70-1810
		70-1811	70-1819	#70-1859						
SR0	000504	#67-453								
SR0H	000506	#67-454								
SR1	000510	#67-455								
SR2	000512	#67-456								
STATUS	= 177776	#66-355	*68-654	*68-660	70-1431	*70-1464	*70-1469	*70-1480	*70-1486	*70-1497
		*70-1532	*70-1542	70-1545	*70-1551	70-1553	*70-1572	70-1575		
STP	011764	70-1256	#70-1257							
STPP	003056	68-703	#68-727							
STPPA	003070	68-727	#68-728							
STP3	013176	70-1375	#70-1383							
STP3D	013210	70-1383	#70-1384							
TAB	=%000003	#66-338	*70-1612	*70-1615	*70-1620	*70-1621				
TABLE	015436	70-1615	#70-1656							
TABLE1	015406	70-1612	#70-1644							
TDEC1	010700	69-1188	#69-1191							
TDEC2	010772	69-1200	#69-1202							
TDEC3	011046	70-1209	#70-1211							
TDEC4	011120	70-1215	#70-1218							
TDEC6	011134	#70-1221								
TDEC7	011146	70-1219	#70-1222							
TDEC77	013766	70-1466	#70-1472							
TDEC8	013754	70-1460	70-1467	#70-1471						
TENSAV	015140	*70-1584	#70-1597	70-1619						
TITLE	017305	68-506	#71-1935							
TNCIS	015170	70-1601	#70-1606							
TONT1	013106	70-1366	#70-1373							
TPB	= 177566	#66-352	*70-1567	*70-1570	71-1957					
TPS	= 177564	#66-351	70-1454	*70-1561	70-1565	70-1568	*70-1571	*70-1579	71-1955	71-1959
TRACE	013062	70-1363	#70-1371							
TRAPA	= 000010	#66-356	68-669	68-676	68-683	68-692	68-699	68-707	68-718	
TRAPB	013604	70-1425	70-1429	#70-1447						
TRAP10	015120	70-1585	#70-1591							
TRAP24	015110	70-1583	#70-1588							
TRCSR	= 177560	#66-350	*70-1516	70-1520						
TRC1	013166	70-1377	70-1380	#70-1382						
TRP240	016712	*70-1813	*70-1815	70-1823	70-1839	#71-1865				
TRT	= 000003	#66-343	68-937	68-943	68-949	68-957	68-965	68-972	68-983	70-1237
TR0	014104	70-1481	#70-1488							
TR2	014116	70-1476	70-1484	#70-1489						
TR3	014236	70-1499	#70-1504							
TR4	014252	70-1500	#70-1506							
TR4A	012740	#70-1356	70-1358							
TR5	014240	70-1493	70-1501	#70-1505						
TSFCIS	015142	70-1587	#70-1598							
TSL	013234	#70-1393								
TST1	000770	68-523	#68-535							
TST10	002452	68-680	68-685	#68-687						

SYMBOL	VALUE	REFERENCES		
TST100	012514	70-1318	70-1329	#70-1331
TST101	013002	70-1331	70-1359	#70-1360
TST102	013122	#70-1375		
TST103	013216	#70-1389		
TST104	013656	#70-1460		
TST105	014004	#70-1476		
TST106	014142	#70-1493		
TST107	014300	#70-1512		
TST11	002600	68-687	68-701	#68-703
TST110	014404	70-1512	70-1521	#70-1523
TST111	014500	#70-1536		
TST112	014654	#70-1558		
TST113	015046	#70-1582		
TST114	015532	#70-1688		
TST115	015756	#70-1717		
TST116	016262	#70-1784		
TST12	003102	#68-731		
TST13	003156	68-731	#68-739	
TST14	003226	68-739	68-744	#68-746
TST15	003300	68-746	68-751	#68-753
TST16	003424	68-753	68-766	#68-768
TST17	003714	68-768	68-792	#68-794
TST2	001314	68-535	68-583	#68-585
TST20	004012	#68-805		
TST21	004054	68-805	#68-811	
TST22	004124	68-811	68-816	#68-817
TST23	004176	68-817	68-822	#68-823
TST24	004324	68-823	68-837	#68-838
TST25	004626	#68-865		
TST26	004670	68-865	#68-871	
TST27	004740	68-871	68-876	#68-877
TST3	001640	68-585	68-624	#68-626
TST30	005012	68-877	68-882	#68-883
TST31	005140	68-883	68-897	#68-898
TST32	005424	68-898	68-921	#68-922
TST33	005522	#68-934		
TST34	005564	68-934	#68-940	
TST35	005634	68-940	68-945	#68-946
TST36	005706	68-946	68-951	#68-952
TST37	006034	68-952	68-967	#68-968
TST4	002074	68-626	68-648	#68-652
TST40	006336	#68-1002		
TST41	006400	68-1002	#68-1008	
TST42	006450	68-1008	68-1013	#68-1014
TST43	006522	68-1014	68-1019	#68-1020
TST44	006650	68-1020	68-1034	#68-1035
TST45	007134	68-1035	68-1058	#68-1059
TST46	007176	68-1059	#68-1065	
TST47	007246	68-1065	68-1070	#68-1071
TST5	002266	68-652	68-665	#68-666
TST50	007320	68-1071	68-1076	#68-1078
TST51	007446	68-1078	69-1093	#69-1094

SYMBOL	VALUE	REFERENCES								
TST52	007730	69-1094	69-1117	#69-1119						
TST53	010062	#69-1134								
TST54	010134	69-1134	69-1139	#69-1140						
TST55	010210	69-1140	69-1145	#69-1146						
TST56	010342	69-1146	69-1160	#69-1161						
TST57	010632	69-1161	69-1184	#69-1185						
TST6	002330	#68-673								
TST60	010742	#69-1198								
TST61	011012	69-1198	69-1203	#70-1206						
TST62	011146	70-1206	#70-1233							
TST63	011224	#70-1234								
TST64	011302	#70-1235								
TST65	011360	#70-1236								
TST66	011436	#70-1237								
TST67	011514	#70-1238								
TST7	002400	68-673	68-678	#68-680						
TST70	011612	70-1240	#70-1241							
TST71	011670	#70-1243								
TST72	011776	#70-1259								
TST73	C:2052	70-1259	#70-1268							
TST74	012146	70-1268	70-1277	#70-1278						
TST75	012230	70-1278	70-1286	#70-1289						
TST76	012310	70-1289	70-1298	#70-1301						
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TTT37	014650	70-1554	#70-1555							
TTY11	014636	70-1536	#70-1554							
TTY3	014554	70-1541	#70-1545							
TTY4	014630	70-1549	#70-1553							
T24TRP	016672	70-1790	#70-1856							
T4TRP	016656	70-1788	#70-1853							
UPAR0	000540	#67-469								
UPAR1	000542	#67-470								
UPAR2	000544	#67-471								
UPAR3	000546	#67-472								
UPAR4	000550	#67-473								
UPAR5	000552	#67-474								
UPAR6	000554	#67-475								
UPAR7	000556	#67-476								
UPDR0	000520	#67-460								
UPDR1	000522	#67-461								
UPDR2	000524	#67-462								
UPDR3	000526	#67-463								
UPDR4	000530	#67-464								
UPDR5	000532	#67-465								
UPDR6	000534	#67-466								
UPDR7	000536	#67-467								
VDEC1	011216	70-1233	#70-1233							
VDEC10	011474	70-1237	70-1237	#70-1237						
VDEC11	011552	70-1238	70-1238	#70-1238						
VDEC12	011564	70-1238	#70-1238							

SYMBOL	VALUE	REFERENCES								
VDEC13	011650	70-1241	70-1241	#70-1241						
VDEC14	011662	70-1241	#70-1241							
VDEC2	011204	70-1233	70-1233	#70-1233						
VDEC3	011274	70-1234	#70-1234							
VDEC4	011262	70-1234	70-1234	#70-1234						
VDEC5	011352	70-1235	#70-1235							
VDEC6	011340	70-1235	70-1235	#70-1235						
VDEC7	011430	70-1236	#70-1236							
VDEC8	011416	70-1236	70-1236	#70-1236						
VDEC9	011506	70-1237	#70-1237							
WATE	015000	70-1563	#70-1575							
WATE1	014722	#70-1565	70-1566							
WATE2	014736	#70-1568	70-1569							
WATE3	014764	#70-1573	70-1577							
WATE4	015042	70-1578	#70-1579							
WATE5	015030	70-1558	#70-1578							
ZTRP	016642	70-1786	#70-1850							
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$DEVCT	000310	#67-445								
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SYMBOL	VALUE	REFERENCES								
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		68-817	68-817	68-817	#68-817	68-822	68-823	68-823	68-823	#68-823
		68-837	68-838	68-838	68-838	#68-838	68-865	68-865	68-865	#68-865
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SYMBOL CROSS REFERENCE CREF

SYMBOL VALUE REFERENCES

68-710 68-711 68-712 68-714 68-720 68-721 68-722 68-723 68-727
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