LSI-11

DECIMAL INSTRUCTION TEST

MD-11-DVKAJ-A

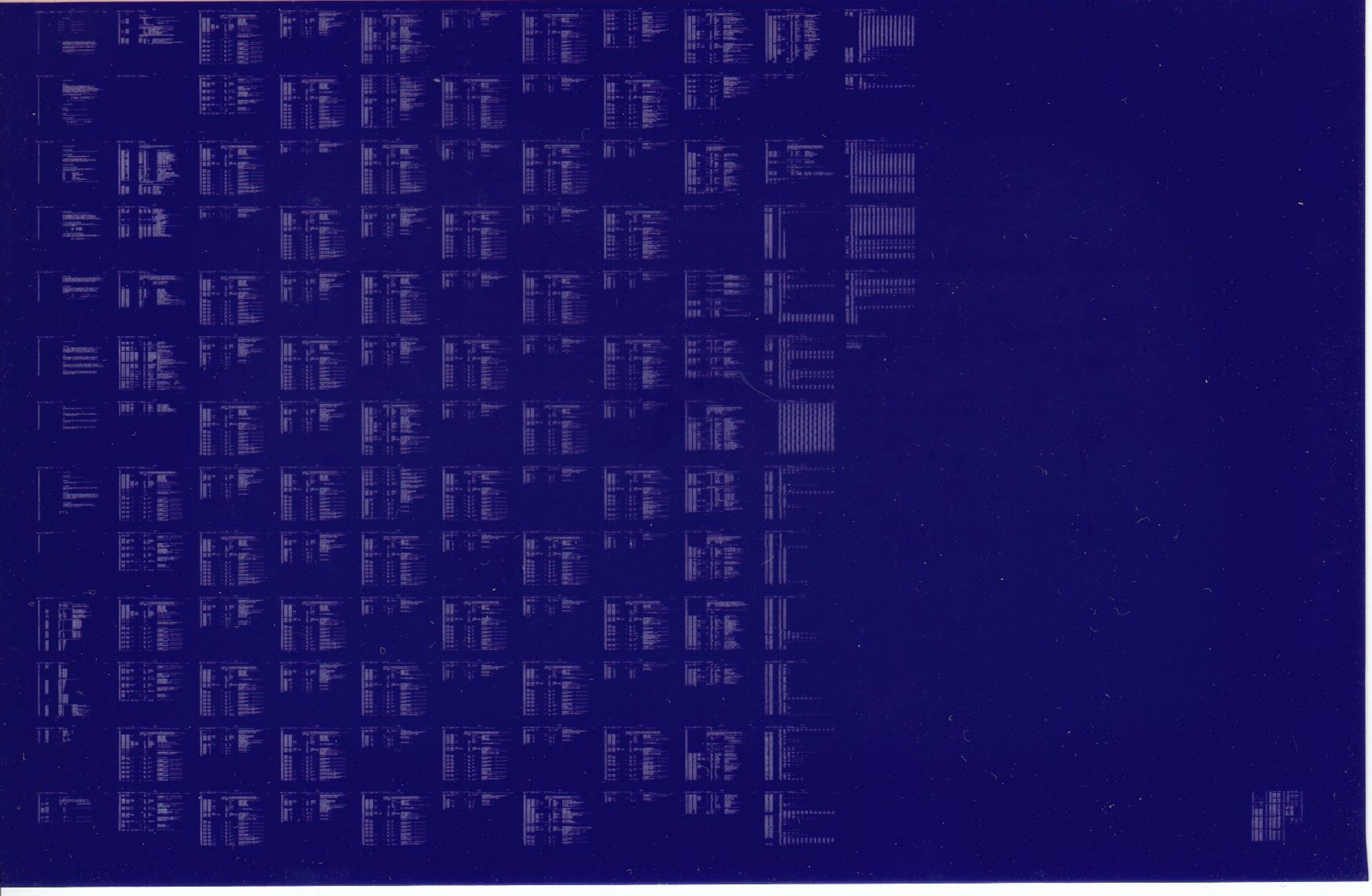
EP DVKAJ A DL A

FICHE 1 OF 1

MAR 1977

digital

MADE IN USA



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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DVKAJ-A-D

PRODUCT NAME: DIS DECIMAL INSTRUCTION TEST

DATE CREATED: FEBRUARY 1977

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: D.J. CASALETTO

1.0 GENERAL INFORMATION

1.1 ABSTRACT

THIS DIAGNOSTIC VERIFIES THE OPERATION OF THE DIBOL DECIMAL
INSTRUCTIONS OF THE LSI-11 [ADDN,SUBN,CMPN,CVTNL].
 THE PROGRAM CHECKS THAT EACH INSTRUCTION IS INTERRUPTABLE
USING THE CONSOLE SLU INTERFACE(SEE PARA 2.3.4) AND RUNS ALTERNATE
PASSES WITH THE TRACE TRAP ENABLED, UNLESS INHIBITED BY THE SWITCH REGISTER (2.
THE PROGRAM IS DESIGNED TO RUN ON AN LSI-11 WITH 4K OF MEMORY AND
THE DIS MICROMS. IT CAN BE RUN UNDER XXDP,APT, AND ACT MONITORS.
THE SOFTWARE SWITCH REGISTER IS AT LOCATION 176.

TO FULLY TEST THE LSI-11 DIBOL INSTRUCTION SET MICROMS, THE
FOLLOWING DIAGNOSTICS MUST BE RUN:

MD-11-DVKAI*	DIS MOVE & STRING INSTRUCTION TEST
MD-11-DVKAJ*	[THIS DIAGNOSTIC]
MD-11-DVKAB*	LSI-11 EIS INSTRUCTION TEST

WHERE "*" IS THE LASTED REVISION

1.2 SYSTEM REQUIREMENTS

1.2.1 EQUIPMENT

LSI-11(KD11-P) WITH A SERIAL LINE INTERFACE AND
4K OF MEMORY

1.2.2 STORAGE

THE PROGRAM USES MEMORY FROM 000000 TO 017040.

1.2.3 PRELIMINARY PROGRAMS

IT IS ASSUMED THAT THE FOLLOWING DIAGNOSTICS HAVE BEEN RUN:

LSI-11 BASIC CPU TEST	MD-11-DVKAA*
LSI-11 TRAPS TEST	MD-11-DVKAD*

WHERE "*" IS THE LASTED REVISION

2.0 OPERATING INSTRUCTIONS

2.1 LOADING PROCEDURES

USE STANDARD PROCEDURE FOR PDP-11 ABSOLUTE BINARY FORMATTED TAPES

2.2 STARTING PROCEDURE

LOAD THE SWITCH REGISTER WITH THE DESIRED SETTING
(SOFTWARE SWITCH REGISTER LOCATION = 176)

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200.
STARTING AT 200, THE PROGRAM CLEARS ALL PROGRAM PARAMETERS AND
THEN PRINTS ITS MAINDEC IDENTIFICATION. "END PASS" IS PRINTED
AT THE END OF EACH FULL PASS OF THE DIAGNOSTIC.

2.3 OPERATING PROCEDURES

2.3.1 OPERATIONAL SWITCH REGISTER

LOCATION 176 IS USED FOR THE SOFTWARE SWITCH REGISTER AND
THE FOLLOWING OPTIONS MAY BE SELECTED BY INSERTING A 1 IN THEIR
RESPECTIVE BIT POSITIONS.

BIT15 - HALT ON ERROR
BIT14 - SCOPE LOOP
BIT13 - INHIBIT ERROR TYPEOUT
BIT12 - INHIBIT TRACE TRAP
BIT11 - UNUSED
BIT10 - UNUSED
BIT09 - LOOP ON ERROR
BIT08 - LOOP ON TEST IN SWR<05:00>
BIT07 - INHIBIT INTERRUPTABILITY TESTS

NOTE: ALL TYPEOUTS CAN BE SUPPRESSED BY MAKING BITS OF BYTE $ENVM
HIGH.

2.3.2 RUNNING UNDER APT

THE APT MAILBOX-ETABLE IS LOCATED AT LOCATION 566.

USING THE CONSOLE INTERFACE AS THE INTERRUPTING DEVICE,
THE INTERRUPTABILTIY TESTS WILL BE RUN ON ONLY THE FIRST PASS TO
AVOID INTERFERENCE WITH THE APT INTERFACE. IF INTERRUPTABILITY
TESTS ARE DESIRED ON ALL PASSES, ANOTHER SLU MUST BE SUPPLIED
AND ITS RECEIVER STATUS REGISTER ADDRESS & ITS INTERRUPT VECTOR MUST
BE PLACED IN THE APT E-TABLE AT LOCATIONS "$BASE" & "$VEC 1" RESPECTIVELY.

2.3.3 RUN WITH ALTERNATE CONSOLE ADDRESS

TO USE A CONSOLE ADDRESS OTHER THAN 177560, THE OPERATOR
MUST SUPPLY THE PROGRAM WITH THE CORRECT ADDRESSES BY INSERTING THEM
AT THE LOCATIONS LABELED:

```
$TKS:   RCSR ADDRESS
$TKB:   RBUF ADDRESS
$TPS:   TCSR ADDRESS
$TPB:   TBUF ADDRESS
```

2.3.4 RUN INTERRUPT TESTS WITH ALTERNATE SLU

TO USE A SERIAL LINE INTERFACE ADDRESS OTHER THAN THE STANDARD
CONSOLE ADDRESS (177560), THE OPERATOR MUST SUPPLY THE CORRECT ADDRESS
AND INTERRUPT VECTOR BY INSERTING THEM IN THE LOCATIONS LABELED:

```
$BASE:  *RCSR ADDRESS*
$VECT1: *RECEIVER INTERRUPT VECTOR*
```

2.4 EXECUTION TIMES

THE GIVEN EXECUTION TIMES TAKE INTO ACCOUNT THE RANDOM CHARACTERISTIC OF THE INTERRUPT TESTS. THE EXECUTION TIME OF THE FIRST PASS IS APPROXIMATELY 10 SECONDS; BUT SUBSEQUENT PASSES WITH INTERRUPT TESTS ENABLED COULD TAKE AS LONG AS 32 SECONDS. THEREFORE THE 32 SECOND EXECUTION TIME IS USED. THE PASS TIME WITHOUT INTERRUPTS IS APPROXIMATELY 2 SECONDS.

3.0 ERROR REPORTING

IF A ROUTINE FAILS AND THE INHIBIT ERROR TYPEOUT (BIT13) OF THE SWR IS NOT SET, THE PC OF THE ERROR IS PRINTED. THE OPERATOR CAN FIND THE ERROR REPORT IN THE COMMENT FIELD OF THAT PC LOCATION IN THE PROGRAM LISTING. IF HALT ON ERROR (BIT15) OF THE SWR IS SET THE PROGRAM WILL HALT AFTER PRINTING THE ERROR PC AND ENTER THE MACHINE ODT.

```
        E.G.    XXXXXX          <--PC OF THE ERROR

                XXXXXX          <--PC+2 OF THE HALT ON ERROR LOCATION
                @               <--ODT ENTERED
```

WHERE "XXXXXX" IS AN OCTAL VALUE

4.0 SUBROUTINE ABSTRACTS

4.1 TRAPCATCHER

A ".+2 - HALT" SEQUENCE IS REPEATED FROM 0-776 TO CATCH ALL UNEXPECTED TRAPS. THUS ALL UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR+2, EXCEPT TRAPS TO LOCATION 0,4, & 10 WHICH GO TO THEIR RESPECTIVE REPORTING ROUTINES "TZERO","TIMTRP", & "ILLTRP". THE OTHER EXCEPTION IS LOCATION 100 (RTC INTERRUPT VECTOR) WHICH CONTAINS A ".+2 - RTI" SEQUENCE (RETURNS FROM THE INTERRUPT).

4.2 SCOPE

THIS ROUTINE CALL IS PLACED BETWEEN EACH SUBTEST. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED & UPDATES THE TEST NUMBER. IF A SCOPE LOOP IS REQUESTED IT WILL JUMP TO THE START OF THE SUBTEST AT WHICH THE SCOPE LOOP IS REQUESTED.

4.3 ERROR

THIS ROUTINE CALL IS PLACED WHEREEVER AN ERROR REPORT IS DESIRED. THE LOWER BYTE OF THIS CALL IS USED AS THE ERROR NUMBER. THIS ROUTINE REPORTS ERRORS TO APT USING "$APTYPE", TYPES ERRORS TO THE CONSOLE USING THE "$TYPE" & "$TYPOCT" ROUTINES, AND HANDLES ERROR RESPONSES VIA SWR SETTINGS.

4.4 $POWER

THIS ROUTINE SAVES ALL GENERAL REGISTERS DURING POWER-DOWN AND RESTORES THEM AT POWER-UP. IF A POWER FAILURE OCCURS "POWER" IS PRINTED AT THE CONSOLE AFTER POWER IS RESTORED AND THE PROGRAM IS RESTARTED AT TEST# 1.

247
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4.5 NPREP

THIS ROUTINE IS USED TO STORE A COPY OF THE INSTRUCTION TEST ARGUMENTS TO BE STORED IN R0-->R5.

4.6 GENR

THIS ROUTINE IS USED TO TRANSFER INSTRUCTION TEST ARGUMENTS TO THE GENERAL REGISTERS AND TO COPY THE STACK POINTER BEFORE THE TEST INSTRUCTION EXECLTION.

4.7 XPSW

THIS ROUTINE IS USED TO STORED THE EXPECTED PSW OF THE INSTRUCTION TEST AND TO SET THE T-BIT IN THE EXPECTED PSW ON PASSES USING THE TRACE TRAP.

4.8 INTR

THIS ROUTINE IS USED TO DETECT WHEN THE TEST INSTRUCTION HAS BEEN INTERRUPTED AND TO CONTINUE THE INTERRUPT STREAM UNTIL THE INSTRUCTION IS INTERRUPTED.

```
                        5.0     MISCELLANEOUS
                                -------------


                        5.1     STACK POINTER
                                -------------
                                STACK POINTER IS INITIALLY SET TO 600.


                        5.2     PASS COUNT
                                ----------
                                A 16 BIT LOCATION "$PASS" IS USED TO KEEP THE PASS COUNT. IT IS
                                CLEARED BY STARTING AT 200.


                        5.3     TEST NUMBER
                                -----------
                                A 16 BIT LOCATION "$TSTNM" IS USED TO KEEP TSACK OF THE SUBTEST
                                NUMBER. THIS NUMBER IS ALSO PLACED IN THE APT E-TABLE AT "$TESTN"
                                WHEN UNDER APT.


                        5.4     POWER FAIL
                                ----------
                                THE DIAGNOSTIC CAN BE POWER FAILED WITH NO ERRORS. AFTER POWERING
                                DOWN AND THEN UP AGAIN, THE PROGRAM WILL RESTAR FROM TEST# 1
                                (I.E., RESTARTS THE PASS THAT WAS INTERRUPTED) AFTER TYPING "POWER"
                                TO THE CONSOLE.  HOWEVER IF THE PROGRAM IS STORED IN MOS MEMORY
                                THAT CAN NOT HOLD DATA WITH POWER DOWN, THEN THE PROGRAM WILL NOT
                                RECOVER FROM A POWER FAIL.


                        5.5     EVENT INTERRUPTS
                                ----------------
                                THIS DIAGNOSTIC CAN BE RUN WITH THE REAL TIME CLOCK ACTIVE
                                (INTERRUPT = 100). LOCATION 100 POINTS TO LOCATION 102
                                WHICH CONTAINS AN "RTI" INSTRUCTION. THUS ON CLOCK INTERRUPTS,
                                AN RTI IS EXECUTED TO HANDLED IT.


                        !

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

```
                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                          STACK=  1100
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                          PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                          DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                          DDISP=  177570          ;;HARDWARE DISPLAY REGISTER

                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
000004                          R4=     %4              ;;GENERAL REGISTER
000005                          R5=     %5              ;;GENERAL REGISTER
000006                          R6=     %6              ;;GENERAL REGISTER
000007                          R7=     %7              ;;GENERAL REGISTER
000006                          SP=     %6              ;;STACK POINTER
000007                          PC=     %7              ;;PROGRAM COUNTER

                                ;*PRIORITY LEVEL DEFINITIONS
000000                          PR0=    0               ;;PRIORITY LEVEL 0
000040                          PR1=    40              ;;PRIORITY LEVEL 1
000100                          PR2=    100             ;;PRIORITY LEVEL 2
000140                          PR3=    140             ;;PRIORITY LEVEL 3
000200                          PR4=    200             ;;PRIORITY LEVEL 4
000240                          PR5=    240             ;;PRIORITY LEVEL 5
000300                          PR6=    300             ;;PRIORITY LEVEL 6
000340                          PR7=    340             ;;PRIORITY LEVEL 7

                                ;*"SWITCH REGISTER" SWITCH DEFINITIONS
100000                          SW15=   100000
040000                          SW14=   40000
020000                          SW13=   20000
010000                          SW12=   10000
004000                          SW11=   4000
002000                          SW10=   2000
001000                          SW09=   1000
000400                          SW08=   400
000200                          SW07=   200
000100                          SW06=   100
000040                          SW05=   40
000020                          SW04=   20
```

```
        000010          SW03=   10
        000004          SW02=   4
        000002          SW01=   2
        000001          SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
        100000          BIT15=  100000
        040000          BIT14=  40000
        020000          BIT13=  20000
        010000          BIT12=  10000
        004000          BIT11=  4000
        002000          BIT10=  2000
        001000          BIT09=  1000
        000400          BIT08=  400
        000200          BIT07=  200
        000100          BIT06=  100
        000040          BIT05=  40
        000020          BIT04=  20
        000010          BIT03=  10
        000004          BIT02=  4
        000002          BIT01=  2
        000001          BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
        000004          ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
        000010          RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
        000014          TBITVEC=14              ;;"T" BIT
        000014          TRTVEC= 14              ;;TRACE TRAP
        000014          BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
        000020          IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
        000024          PWRVEC= 24              ;;POWER FAIL
        000030          EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
        000034          TRAPVEC=34              ;;"TRAP" TRAP
        000060          TKVEC=  60              ;;TTY KEYBOARD VECTOR
        000064          TPVEC=  64              ;;TTY PRINTER VECTOR
        000240          PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
```

```
        000200                          APTSIZE=        200
        000001                          APTENV= 001
        000100                          APTSPOOL=       100
        000040                          APTCSUP=        040
        171400                          $SWR=   171400
        000300                          $SWRMK= 300
        000020                          TBIT=   20
        000001                          $TN=    1
        000001                          N=      1
        000000                          X=      $TN-1
        177777                          NXM=    177777
        177560                          ABASE=  177560
        000060                          AVECT1= 60
        000000                          .=0
```

```
                                .SBTTL  TRAP CATCHER

                        000000          .=0
                                ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                        000174          .=174
000174  000000         DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
000176  000000         SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER

                        000000          .=0
000000  014702                  TZERO           ;SET LOCATIONS 0,4,6 TO ERROR REPORTS
000002  000340                  340
000004  014712                  TIMTRP
000006  000340                  340
000010  014722                  ILLTRP
000012  000340                  340

                        000100          .=100
000100  000102                  .WORD   102             ;HANDLE EVENT LINE INTERRUPTS
000102  000002                  .WORD   2

                        000200          .=200
000200  000167  000512          JMP     START           ;STARTING LOCATION FOR PROGRAM
```

```
                        .=400
                .SBTTL  ACT11 HOOKS


                ;;******************************************************************
                ;HOOKS REQUIRED BY ACT11
                        $SVPC=.                 ;SAVE PC
                        .=46
                        $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$ECP
                        .=52
                        .WORD   0               ;;2)SET LOC.52 TO ZERO
                        .=$SVPC                 ;; RESTORE PC
                .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
                        200     ;;.OR APT START UP
                        .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
                        $APTHDR ;;POINT TO APT HEADER BLOCK
                        .=.$X   ;;RESET LOCATION COUNTER
                ;;******************************************************************
                ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                ;INTERFACE SPEC.

                $APTHD:
                $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
                $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
                $TSTM:  .WORD   30      ;;RUN TIM OF LONGEST TEST
                $PASTM: .WORD   40.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
                $UNITM: .WORD           ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
                        .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```
   544
```

```
                                .SBTTL  COMMON TAGS

                                ;;**********************************************************************
                                ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.

                        000500          .=500
000500                  000000  $CMTAG:                         ;;START OF COMMON TAGS
                                .WORD   0
000502          000             $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
000503          000             $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
000504          000000          $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
000506          000000          $LPADR: .WORD   -               ;;CONTAINS SCOPE LOOP ADDRESS
000510          000000          $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
000512          000000          $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
000514          000             $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
000515          001             $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
000516          000000          $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
000520          000000          $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
000522          000000          $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
000524          000000          $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
000526          000000          $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
000530          000000                  .WORD   0               ;;RESERVED--NOT TO BE USED
000532          000000                  .WORD   0
000534          000             $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
000535          000             $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
000536          000000                  .WORD   0
000540          177570  SWR:     .WORD   DSWR                   ;;ADDRESS OF SWITCH REGISTER
000542          177570  DISPLAY: .WORD   DDISP                  ;;ADDRESS OF DISPLAY REGISTER
000544          177560  $TKS:    177560                         ;;TTY KBD STATUS
000546          177562  $TKB:    177562                         ;;TTY KBD BUFFER
000550          177564  $TPS:    177564                         ;;TTY PRINTER STATUS REG. ADDRESS
000552          177566  $TPB:    177566                         ;;TTY PRINTER BUFFER REG. ADDRESS
000554          000     $NULL:   .BYTE   0                      ;;CONTAINS NULL CHARACTER FOR FILLS
000555          002     $FILLS:  .BYTE   2                      ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
000556          012     $FILLC:  .BYTE   12                     ;;INSERT FILL CHARS. AFTER A "LINE FEED"
000557          000     $TPFLG:  .BYTE   0                      ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
000560          000000  $ESCAPE:0                              ;;ESCAPE ON ERROR ADDRESS
000562          077     $QUES:   .ASCII  /?/                    ;;QUESTION MARK
000563          015     $CRLF:   .ASCII  <15>                   ;;CARRIAGE RETURN
000564          000012  $LF:     .ASCIZ  <12>                   ;;LINE FEED
                                ;;**********************************************************************
                                .SBTTL  APT MAILBOX-ETABLE

                                ;;**********************************************************************
                                .EVEN
000566                  $MAIL:                          ;;APT MAILBOX
000566          000000  $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
000570          000000  $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
000572          000000  $TESTN: .WORD   ATESTN          ;;TEST NUMBER
000574          000000  $PASS:  .WORD   APASS           ;;PASS COUNT
000576          000000  $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
000600          000000  $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
000602          000000  $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
000604          000000  $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
000606                  $ETABLE:                        ;;APT ENVIRONMENT TABLE
```

```
000606     000           $ENV:    .BYTE   AENV     ;;ENVIRONMENT BYTE
000607     000           $ENVM:   .BYTE   AENVM    ;;ENVIRONMENT MODE BITS
000610  000000           $SWREG:  .WORD   ASWREG   ;;APT SWITCH REGISTER
000612  000000           $USWR:   .WORD   AUSWR    ;;USER SWITCHES
000614  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
000616     000           $MAMS1:  .BYTE   AMAMS1   ;;HIGH ADDRESS,M.S. BYTE
000617     000           $MTYP1:  .BYTE   AMTYP1   ;;MEM. TYPE,BLK#1
                         ;*                        MEM.TYPE BYTE   --  (HIGH BYTE)
                         ;*                                 900 NSEC CORE=001
                         ;*                                 300 NSEC BIPOLAR=002
                         ;*                                 500 NSEC MOS=003
000620  000000           $MADR1:  .WORD   AMADR1   ;;HIGH ADDRESS,BLK#1
                         ;*                          MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
000622     000           $MAMS2:  .BYTE   AMAMS2   ;;HIGH ADDRESS,M.S. BYTE
000623     000           $MTYP2:  .BYTE   AMTYP2   ;;MEM.TYPE,BLK#2
000624  000000           $MADR2:  .WORD   AMADR2   ;;MEM.LAST ADDRESS,BLK#2
000626     000           $MAMS3:  .BYTE   AMAMS3   ;;HIGH ADDRESS,M.S.BYTE
000627     000           $MTYP3:  .BYTE   AMTYP3   ;;MEM.TYPE,BLK#3
000630  000000           $MADR3:  .WORD   AMADR3   ;;MEM.LAST ADDRESS,BLK#3
000632     000           $MAMS4:  .BYTE   AMAMS4   ;;HIGH ADDRESS,M.S.BYTE
000633     000           $MTYP4:  .BYTE   AMTYP4   ;;MEM.TYPE,BLK#4
000634  000000           $MADR4:  .WORD   AMADR4   ;;MEM.LAST ADDRESS,BLK#4
000636  000060           $VECT1:  .WORD   AVECT1   ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
000640  000000           $VECT2:  .WORD   AVECT2   ;;INTERRUPT VECTOR#2BUS PRIORITY#2
000642  177560           $BASE:   .WORD   ABASE    ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
000644                   $ETEND:
                         .MEXIT
```

```
                                        .SBTTL  ERROR POINTER TABLE

                                        ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                        ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                        ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                        ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                        ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                        ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                        ;*      DH              ;;POINTS TO THE DATA HEADER
                                        ;*      DT              ;;POINTS TO THE DATA
                                        ;*      DF              ;;POINTS TO THE DATA FORMAT


000644                                  $ERRTB:

000644  000000                          S1LN:   .WORD   0               ;SOURCE1 LENGTH
000646  000000                          S1ADR:  .WORD                   ;SOURCE1 ADDRESS
000650  000000                          S2LN:   .WORD   0               ;SOURDE2 LENGTH
000652  000000                          S2ADR:  .WORD   0               ;SOURCE2 ADDRESS
000654  000000                          DSTLN:  .WORD                   ;DESTINATION LENGTH
000656  017000                          DSTAD:  .WORD   BUF             ;DESTINATION ADDRESS
000660  000000                          FILL:   .WORD                   ;FILL CHARACTER
000662  000000                          TABLE:  .WORD   0               ;TRANSLATION TABLE ADDRESS
000664  177564                          TCSR:   177564                  ;TCSR ADDRESS OF SLU USED FOR INTERRUPTS
000666  177566                          TBUF:   177566                  ;TBUF ADDRESS
000670  000064                          TVECT:  64                      ;TRANSMIT INTERRUPT VECTOR
000672  000066                          TPSW:   66                      ;   AND PSW LOCATION
000674  000000                          PCI:    0                       ;ADDRESS OF TEST INSTRUCTION TO INTERRUPT
000676  000000                          CCODES: 0                       ;CONDITION CODES AFTER EXECUTION OF TEST INSTRUCTION
000700  000000                          EXPPSW: 0                       ;EXPECTED PSW
000702  000000                          SAVR6:  0                       ;STACK POINTER VALUE BEFORE TEST INSTRUCTION EXECUTION
000704  000000                          BADR6:  0                       ;BAD STACK POINTER VALUE
000706  000000                          OLDPC:  0                       ;ADDRESS WHERE UNEXPECTED TRAP OR INTERRUPT OCCURRED
000710  000000                          TEMP:   0
000712  000000                          TEMP1:  0
000714  000000                          TEMP2:  0
```

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000716  005067  177646                  START:  CLR     $FATAL            ;CLEAR ERROR NO.
000722  005067  177640                          CLR     $MSGTYP           ;CLEAR MESSAGE TYPE
000726  005067  177640                          CLR     $TESTN            ;CLEAR TEST NO.
                                        .SBTTL  INITIALIZE THE COMMON TAGS
                                                                          ;CLEAR THE COMMON TAGS ($CMTAG) AREA
000732  012706  000500                          MOV     #$CMTAG,R6        ;FIRST LOCATION TO BE CLEARED
000736  005026                                  CLR     (R6)+             ;CLEAR MEMORY LOCATION
000740  022706  000540                          CMP     #SWR,R6 ;DONE?
000744  001374                                  BNE     .-6               ;LOOP BACK IF NO
000746  012706  000500                          MOV     #500,SP           ;SETUP THE STACK POINTER
                                                                          ;INITIALIZE A FEW VECTORS
000752  012737  015150  000020                  MOV     #$SCOPE,@#IOTVEC  ;IOT VECTOR FOR SCOPE ROUTINE
000760  012737  000340  000022                  MOV     #340,@#IOTVEC+2   ;LEVEL 7
000766  012737  015546  000030                  MOV     #$ERROR,@#EMTVEC  ;EMT VECTOR FOR ERROR ROUTINE
000774  012737  000340  000032                  MOV     #340,@#EMTVEC+2   ;LEVEL 7
001002  012737  016712  000034                  MOV     #$TRAP,@#TRAPVEC  ;TRAP VECTOR FOR TRAP CALLS
001010  012737  000340  000036                  MOV     #340,@#TRAPVEC+2;LEVEL 7
001016  012737  015346  000024                  MOV     #$PWRDN,@#PWRVEC  ;POWER FAILURE VECTOR
001024  012737  000340  000026                  MOV     #340,@#PWRVEC+2   ;LEVEL 7
001032  016767  013510  013500                  MOV     $ENDCT,$EOPCT     ;SETUP END-OF-PROGRAM COUNTER
001040  005067  177514                          CLR     $ESCAPE           ;CLEAR THE ESCAPE ON ERROR ADDRESS
001044  112767  000001  177443                  MOVB    #1,$ERMAX         ;ALLOW ONE ERROR PER TEST
                                                                          ;INITIALIZE THE "T-BIT" TRAP VECTOR. THEN LOAD LOCATION
                                                                          ;THE "END-OF-PASS" ($EOP) ROUTINE. WITH A "RTI" OR "RTT"
001052  012737  014650  000014                  MOV     #$RTRN,@#TBITVEC  ;SET "T" BIT VECTOR TO $RTRN
001060  012737  000340  000016                  MOV     #340,@#TBITVEC+2  ;LEVEL 7
001066  012767  000002  013554                  MOV     #RTI,$RTRN        ;SET $RTRN TO A RTI
001074  013767  000010  177606                  MOV     @#RESVEC,TEMP     ;SAVE ILLEGAL INSTRUCTION TRAP VECTOR
001102  012737  001130  000010                  MOV     #2$,@#RESVEC      ;TRY TO DO A RTT
001110  005046                                  CLR     -(SP)             ;DUMMY PS
001112  012746  001120                          MOV     #1$,-(SP)         ;AND PC
001116  000006                                  RTT                       ;TRY THE RTT
001120  012767  000006  013522  1$:             MOV     #RTT,$RTRN        ;RTT IS LEGAL--SET $RTRN TO A RTT
001126  000402                                  BR      3$
001130  062706  000010          2$:             ADD     #10,SP            ;RTT ILLEGAL--CLEAN OFF THE STACK
001134  016737  177550  000010  3$:             MOV     TEMP,@#RESVEC     ;RESTORE ILLEGAL INSTRUCTION TRAP VECTOR
001142  005067  013510                          CLR     $TBIT             ;CLEAR "T" BIT SWITCH
001146  012767  001146  177332                  MOV     #.,$LPADR         ;INITIALIZE THE LOOP ADDRESS FOR SCOPE
001154  012767  001154  177326                  MOV     #.,$LPERR         ;SETUP THE ERROR LOOP ADDRESS
                                                                          ;SETUP FOR A SOFTWARE SWITCH REGISTER.
001162  012767  000176  177350                  MOV     #SWREG,SWR        ;POINT TO SOFTWARE SWR
001170  012767  000174  177344                  MOV     #DISPREG,DISPLAY

001176  005067  177372                          CLR     $PASS             ;CLEAR PASS COUNT
001202  132767  000200  177377                  BITB    #APTSIZE,$ENVM    ;TEST USER SIZE UNDER APT
001210  001403                                  BEQ     4$                ;YES,USE NON-APT SWITCH
001212  012767  000610  177320                  MOV     #$SWREG,SWR       ;NO,USE APT SWITCH REGISTER
001220                                  4$:
001220  026737  013360  000042                  CMP     $ENDAD,@#42       ;UNDER ACT11?
001226  001424                                  BEQ     BEGIN             ;BR, IF YES (SKIP PROGRAM ID TYPEOUT WHEN UNDER AACT)
001230  104401  016760                          TYPE.   NAME
                                                                          ;SET UP ADDRESSES OF SLU TO USE FOR INTERRUPTABILITY TES
001234  013700  000642                          MOV     @#$BASE,R0        ;GET ADDRESS OF THE SLU
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001240  062700  000004            ADD     #4,R0           ;ADJUST TO TCSR ADDRESS
001244  010037  000664            MOV     R0,@#TCSR       ;STORE TCSR ADDRESS
001250  005720                    TST     (R0)+           ;ADJUST TO TBUF ADDRESS
001252  010037  000666            MOV     R0,@#TBUF       ;STORE TBUF ADDRESS
001256  013700  000636            MOV     @#$VECT1,R0     ;GET SLU INTERRUPT VECTOR
001262  062700  000004            ADD     #4,R0           ;ADJUST TO TRANSMIT INTERRUPT VECTOR
001266  010037  000670            MOV     R0,@#TVECT      ;STORE TRANSMIT INTERRUPT VECTOR
001272  005720                    TST     (R0)+           ;ADJUST TO TRANSMIT INTERRUPT PSW
001274  010037  000672            MOV     R0,@#TPSW       ;STORE TRANSMIT INTERRUPT PSW LOCATION


001300  106427  000200    BEGIN:  MTPS    #200            ;SET PRIORITY TO 7

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                                        ;;*****************************************************************
                                        ;*TEST 1         TEST "ADDN" WITH SOURCE1 LENGTH =0 & SOURCE2 STRING VALID
                                        ;;*****************************************************************
001304  000304                  TST1:   SCOPE
001306  004567  013420                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
001312  000000                          0                       ;SOURCE1 LENGTH
001314  001550                          S1T1                    ;SOURCE1 ADDRESS
001316  000001                          1                       ;SOURCE2 LENGTH
001320  001551                          S2T1                    ;SOURCE2 ADDRESS
001322  000000                          0                       ;DESTINATION LENGTH
001324  004767  013474                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
001330  013767  000010  177354          MOV     @#10,TEMP1      ;SAVE TIMEOUT TRAP VECTOR CONTENTS
001336  013767  000012  177350          MOV     @#12,TEMP2
001344  012737  001402  000010          MOV     #T1CONT,@#10    ;POINT TIMEOJT VECTOR TO TEST CONTINUATION
001352  012737  000340  000012          MOV     #340,@#12
001360  004567  013460                  JSR     R5,XPSW         ;STORE EXPECTED PSW VALUE
001364  000217                          .WORD   217
001366  004767  013366                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
001372  000277                          SCC
                                
001374  076050                  T1:     ADDN                    ;EXECUTE "ADDN" INSTRUCTION
                                
001376  104001                          ERROR   1               ;***************TEST 1 - ERROR 1***************
                                                                ;DECIMAL INSTRUCTION DID NOT TRAP ON
                                                                ;A ZERO SOURCE1 LENGTH
001400  000464                          BR ENDT1
                                
001402                          T1CONT:
001402  020067  177236                  CMP     R0,S1LN         ;CHECK R0 UNCHANGED
001406  001401                          BEQ     64$
001410  104002                          ERROR   2               ;***************TEST 1 - ERROR 2***************
                                                                ;R0 CHANGED
                                                                ;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
001412  020167  177230          64$:    CMP     R1,S1ADR        ;CHECK R1 UNCHANGED
001416  001401                          BEQ     65$
001420  104003                          ERROR   3               ;***************TEST 1 - ERROR 3***************
                                                                ;R1 CHANGED
                                                                ;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
001422  020267  177222          65$:    CMP     R2,S2LN         ;CHECK R2 UNCHANGED
001426  001401                          BEQ     66$
001430  104004                          ERROR   4               ;***************TEST 1 - ERROR 4***************
                                                                ;R2 CHANGED
                                                                ;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
001432  020367  177214          66$:    CMP     R3,S2ADR        ;CHECK R3 UNCHANGED
001436  001401                          BEQ     67$
001440  104005                          ERROR   5               ;***************TEST 1 - ERROR 5***************
                                                                ;R3 CHANGED
                                                                ;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
001442  020467  177212          67$:    CMP     R4,FILL         ;CHECK  R4 UNCHANGED
001446  001401                          BEQ     68$
001450  104006                          ERROR   6               ;***************TEST 1 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
001452  020567  177200          68$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
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                001456  001401                          BEQ     69$
                001460  104007                          ERROR   7               ;****************TEST 1 - ERROR 7***************
                                                                                ;R5 CHANGED
                                                                                ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
                001462                          69$:
                001462  016600  000002                  MOV     2(SP),R0        ;CHECK PSW AT TIME OF TRAP
                001466  042700  177400                  BIC     #177400,R0
                001472  020067  177202                  CMP     R0,EXPPSW
                001476  001401                          BEQ     1$
                001500  104010                          ERROR   10              ;****************TEST 1 - ERROR 10***************
                                                                                ;PSW ERROR
                                                                                ;EXPECTED PSW IS STORED AT "EXPPSW"
                                                                                ;RESULTANT PSW IS IN R0
                001502  021627  001376          1$:     CMP     (SP),#T1+2      ;CHECK ADDRESS OF TRAP
                001506  001403                          BEQ     2$
                001510  011637  000522                  MOV     (SP),@#$BDADR   ;STORE BAD ADDRESS
                001514  104011                          ERROR   11              ;****************TEST 1 - ERROR 11***************
                                                                                ;TRAP ADDRESS ERROR
                                                                                ;EXPECTED ADDRESS IS "T1+2"
                                                                                ;RESULTANT ADDRESS IS STORED AT "$BDADR"
                001516  010600          2$:     MOV     SP,R0           ;CHECK SP RESTORATION
                001520  062700  000004                  ADD     #4,R0
                001524  020037  000702                  CMP     R0,@#SAVR6
                001530  001401                          BEQ     3$
                001532  104012                          ERROR   12              ;****************TEST 1 - ERROR 12***************
                                                                                ;STACK POINTER WAS NOT RESTORED
                                                                                ;EXPECTED SP VALUE IS STORED AT "SAVR6"
                                                                                ;ERRONEOUS SO VALJE IS AT "BADR6"
                001534  012716  001552          3$:     MOV     #ENDT1,(SP)     ;RESTORE SP & PSW
                001540  013766  000700  000002          MOV     @#EXPPSW,2(SP)
                001546  000002                          RTI
                001550                          S1T1:
                001550      060                         .BYTE   60              ;SOURCE1 STRING
                001551                          S2T1:                           ;MOST SIGNIFICANT DIGIT
                001551      060                         .BYTE   60              ;SOURCE2 STRING
                                                        .EVEN                   ;MOST SIGNIFICANT DIGIT
                001552  016737  177134  000010  ENDT1:  MOV     TEMP1,@#10      ;RESTORE TIMEOUT VECTOR CONTENTS
                001560  016737  177130  000012          MOV     TEMP2,@#12
```

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                                ;;*****************************************************************
                                ;*TEST 2        TEST "ADDN" WITH A POSITIVE LEADING SIGN SOURCE1, & VALID SOURCE2
                                ;;*****************************************************************
001566  000004                TST2:   SCOPE
001570  004567  013136                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
001574  000001                        1                       ;SOURCE1 LENGTH
001576  002032                        S1T2                    ;SOURCE1 ADDRESS
001600  000001                        1                       ;SOURCE2 LENGTH
001602  002033                        S2T2                    ;SOURCE2 ADDRESS
001604  000000                        0                       ;DESTINATION LENGTH
001606  004767  013212                JSR     PC,CLBUF        ;CLEAR BUFFER AREA
001612  013767  000010  177072        MOV     @#10,TEMP1      ;SAVE TIMEOUT TRAP VECTOR CONTENTS
001620  013767  000012  177066        MOV     @#12,TEMP2
001626  012737  001664  000010        MOV     #T2CONT,@#10    ;POINT TIMEOJT VECTOR TO TEST CONTINUATION
001634  012737  000340  000012        MOV     #340,@#12
001642  004567  013176                JSR     R5,XPSW         ;STORE EXPECTED PSW VALUE
001646  000217                        .WORD   217
001650  004767  013104                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
001654  000277                        SCC

001656  076050                T2:     ADDN                    ;EXECUTE "ADDN" INSTRUCTION

001660  104001                        ERROR   1               ;***************TEST 2 - ERROR 1***************
                                                            ;DECIMAL INSTRUCTION DID NOT TRAP ON
                                                            ;A POSITIVE LEADING SIGN SOURCE1
001662  000464                        BR ENDT2

001664                          T2CONT:
001664  020067  176754                CMP     R0,S1LN         ;CHECK R0 UNCHANGED
001670  001401                        BEQ     64$
001672  104002                        ERROR   2               ;***************TEST 2 - ERROR 2***************
                                                            ;R0 CHANGED
                                                            ;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
001674  020167  176746        64$:    CMP     R1,S1ADR        ;CHECK R1 UNCHANGED
001700  001401                        BEQ     65$
001702  104003                        ERROR   3               ;***************TEST 2 - ERROR 3***************
                                                            ;R1 CHANGED
                                                            ;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
001704  020267  176740        65$:    CMP     R2,S2LN         ;CHECK R2 UNCHANGED
001710  001401                        BEQ     66$
001712  104004                        ERROR   4               ;***************TEST 2 - ERROR 4***************
                                                            ;R2 CHANGED
                                                            ;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
001714  020367  176732        66$:    CMP     R3,S2ADR        ;CHECK R3 UNCHANGED
001720  001401                        BEQ     67$
001722  104005                        ERROR   5               ;***************TEST 2 - ERROR 5***************
                                                            ;R3 CHANGED
                                                            ;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
001724  020467  176730        67$:    CMP     R4,FILL         ;CHECK  R4 UNCHANGED
001730  001401                        BEQ     68$
001732  104006                        ERROR   6               ;***************TEST 2 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
001734  020567  176716        68$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
```

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                                                BEQ     69$
                                                ERROR   7             ;****************TEST 2 - ERROR 7***************
                                                                      ;R5 CHANGED
                                                                      ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
                                        69$:
                                                MOV     2(SP),R0      ;CHECK PSW AT TIME OF TRAP
                                                BIC     #177400,R0
                                                CMP     R0,EXPPSW
                                                BEQ     1$
                                                ERROR   10            ;****************TEST 2 - ERROR 10***************
                                                                      ;PSW ERROR
                                                                      ;EXPECTED PSW IS STORED AT "EXPPSW"
                                                                      ;RESULTANT PSW IS IN R0
                                        1$:     CMP     (SP),#T2+2    ;CHECK ADDRESS OF TRAP
                                                BEQ     2$
                                                MOV     (SP),@#$BDADR ;STORE BAD ADDRESS
                                                ERROR   11            ;****************TEST 2 - ERROR 11***************
                                                                      ;TRAP ADDRESS ERROR
                                                                      ;EXPECTED ADDRESS IS "T2+2"
                                                                      ;RESULTANT ADDRESS IS STORED AT "$BDADR"
                                        2$:     MOV     SP,R0         ;CHECK SP RESTORATION
                                                ADD     #4,R0
                                                CMP     R0,@#SAVR6
                                                BEQ     3$
                                                ERROR   12            ;****************TEST 2 - ERROR 12***************
                                                                      ;STACK POINTER WAS NOT RESTORED
                                                                      ;EXPECTED SP VALUE IS STORED AT "SAVR6"
                                                                      ;ERRONEOUS SO VALUE IS AT "BADR6"
                                        3$:     MOV     #ENDT2,(SP)   ;RESTORE SP & PSW
                                                MOV     @#EXPPSW,2(SP)
                                                RTI
                                        S1T2:                         ;SOURCE1 STRING
                                                .BYTE   55            ;MOST SIGNIFICANT DIGIT
                                        S2T2:                         ;SOURCE2 STRING
                                                .BYTE   60            ;MOST SIGNIFICANT DIGIT
                                                .EVEN
                                        ENDT2:  MOV     TEMP1,@#10    ;RESTORE TIMEOUT VECTOR CONTENTS
                                                MOV     TEMP2,@#12
```

```
                                ;;*****************************************************************
                                ;*TEST 3         TEST "ADDN" WITH A NEGATIVE LEADING SIGN SOURCE1, & VALID SOURCE2
                                ;;*****************************************************************
002050  000004                TST3:   SCOPE
002052  004567  012654                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
002056  000001                        1                       ;SOURCE1 LENGTH
002060  002314                        S1T3                    ;SOURCE1 ADDRESS
002062  000001                        1                       ;SOURCE2 LENGTH
002064  002315                        S2T3                    ;SOURCE2 ADDRESS
002066  000000                        0                       ;DESTINATION LENGTH
002070  004767  012730                JSR     PC,CLBUF        ;CLEAR BUFFER AREA
002074  013767  000010  176610        MOV     @#10,TEMP1      ;SAVE TIMEOUT TRAP VECTOR CONTENTS
002102  013767  000012  176604        MOV     @#12,TEMP2
002110  012737  002146  000010        MOV     #T3CONT,@#10    ;POINT TIMEOUT VECTOR TO TEST CONTINUATION
002116  012737  000340  000012        MOV     #340,@#12
002124  004567  012714                JSR     R5,XPSW         ;STORE EXPECTED PSW VALUE
002130  000217                        .WORD   217
002132  004767  012622                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
002136  000277                        SCC

002140  076050                T3:     ADDN                    ;EXECUTE "ADDN" INSTRUCTION

002142  104001                        ERROR   1               ;***************TEST 3 - ERROR 1***************
                                                            ;DECIMAL INSTRUCTION DID NOT TRAP ON
                                                            ;A NEGATIVE LEADING SIGN SOURCE2
002144  000464                        BR ENDT3

002146                          T3CONT:
002146  020067  176472                CMP     R0,S1LN         ;CHECK R0 UNCHANGED
002152  001401                        BEQ     64$
002154  104002                        ERROR   2               ;***************TEST 3 - ERROR 2***************
                                                            ;R0 CHANGED
                                                            ;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
002156  020167  176464          64$:  CMP     R1,S1ADR        ;CHECK R1 UNCHANGED
002162  001401                        BEQ     65$
002164  104003                        ERROR   3               ;***************TEST 3 - ERROR 3***************
                                                            ;R1 CHANGED
                                                            ;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
002166  020267  176456          65$:  CMP     R2,S2LN         ;CHECK R2 UNCHANGED
002172  001401                        BEQ     66$
002174  104004                        ERROR   4               ;***************TEST 3 - ERROR 4***************
                                                            ;R2 CHANGED
                                                            ;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
002176  020367  176450          66$:  CMP     R3,S2ADR        ;CHECK R3 UNCHANGED
002202  001401                        BEQ     67$
002204  104005                        ERROR   5               ;***************TEST 3 - ERROR 5***************
                                                            ;R3 CHANGED
                                                            ;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
002206  020467  176446          67$:  CMP     R4,FILL         ;CHECK  R4 UNCHANGED
002212  001401                        BEQ     68$
002214  104006                        ERROR   6               ;***************TEST 3 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
002216  020567  176434          68$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
```

```
002222  001401                          BEQ     69$
002224  104007                          ERROR   7               ;***************TEST 3 - ERROR 7***************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
002226                          69$:
002226  016600  000002                  MOV     2(SP),R0        ;CHECK PSW AT TIME OF TRAP
002232  042700  177400                  BIC     #177400,R0
002236  020067  176436                  CMP     R0,EXPPSW
002242  001401                          BEQ     1$
002244  104010                          ERROR   10              ;***************TEST 3 - ERROR 10***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "EXPPSW"
                                                                ;RESULTANT PSW IS IN R0
002246  021627  002142          1$:     CMP     (SP),#T3+2      ;CHECK ADDRESS OF TRAP
002252  001403                          BEQ     2$
002254  011637  000522                  MOV     (SP),@#$BDADR   ;STORE BAD ADDRESS
002260  104011                          ERROR   11              ;***************TEST 3 - ERROR 11***************
                                                                ;TRAP ADDRESS ERROR
                                                                ;EXPECTED ADDRESS IS "T3+2"
                                                                ;RESULTANT ADDRESS IS STORED AT "$BDADR"
002262  010600                  2$:     MOV     SP,R0           ;CHECK SP RESTORATION
002264  062700  000004                  ADD     #4,R0
002270  020037  000702                  CMP     R0,@#SAVR6
002274  001401                          BEQ     3$
002276  104012                          ERROR   12              ;***************TEST 3 - ERROR 12***************
                                                                ;STACK POINTER WAS NOT RESTORED
                                                                ;EXPECTED SP VALUE IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
002300  012716  002316          3$:     MOV     #ENDT3,(SP)     ;RESTORE SP & PSW
002304  013766  000700  000002          MOV     @#EXPPSW,2(SP)
002312  000002                          RTI

002314                          S1T3:                           ;SOURCE1 STRING
002314     053                          .BYTE   53              ;MOST SIGNIFICANT DIGIT
002315                          S2T3:                           ;SOURCE2 STRING
002315     060                          .BYTE   60              ;MOST SIGNIFICANT DIGIT
                                        .EVEN

002316  016737  176370  000010  ENDT3:  MOV     TEMP1,@#10      ;RESTORE TIMEOUT VECTOR CONTENTS
002324  016737  176364  000012          MOV     TEMP2,@#12
```

```
                                        ;;*****************************************************************
                                        ;*TEST 4         TEST "ADDN" WITH SOURCE2 LENGTH = 0, & VALID SOURCE1
                                        ;;*****************************************************************
002332  000004                TST4:   SCOPE
002334  004567  012372                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
002340  000001                        1                       ;SOURCE1 LENGTH
002342  002576                        S1T4                    ;SOURCE1 ADDRESS
002344  000000                        0                       ;SOURCE2 LENGTH
002346  002577                        S2T4                    ;SOURCE2 ADDRESS
002350  000000                        0                       ;DESTINATION LENGTH
002352  004767  012446                JSR     PC,CLBUF        ;CLEAR BUFFER AREA
002356  013767  000010  176326        MOV     @#10,TEMP1      ;SAVE TIMEOUT TRAP VECTOR CONTENTS
002364  013767  000012  176322        MOV     @#12,TEMP2
002372  012737  002430  000010        MOV     #T4CONT,@#10    ;POINT TIMEOUT VECTOR TO TEST CONTINUATION
002400  012737  000340  000012        MOV     #340,@#12
002406  004567  012432                JSR     R5,XPSW         ;STORE EXPECTED PSW VALUE
002412  000217                        .WORD   217
002414  004767  012340                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
002420  000277                        SCC

002422  076050                T4:     ADDN                    ;EXECUTE "ADDN" INSTRUCTION

002424  104001                        ERROR   1               ;***************TEST 4 - ERROR 1***************
                                                            ;DECIMAL INSTRUCTION DID NOT TRAP ON
                                                            ;A ZERO SOURCE2 LENGTH
002426  000464                        BR ENDT4

002430                          T4CONT:
002430  020067  176210                CMP     R0,S1LN         ;CHECK R0 UNCHANGED
002434  001401                        BEQ     64$
002436  104002                        ERROR   2               ;***************TEST 4 - ERROR 2***************
                                                            ;R0 CHANGED
                                                            ;R0 SHOULD STILL EQUAL CONTENTS OF "S1LN"
002440  020167  176202        64$:    CMP     R1,S1ADR        ;CHECK R1 UNCHANGED
002444  001401                        BEQ     65$
002446  104003                        ERROR   3               ;***************TEST 4 - ERROR 3***************
                                                            ;R1 CHANGED
                                                            ;R1 SHOULD STILL EQUAL CONTENTS OF "S1ADR"
002450  020267  176174        65$:    CMP     R2,S2LN         ;CHECK R2 UNCHANGED
002454  001401                        BEQ     66$
002456  104004                        ERROR   4               ;***************TEST 4 - ERROR 4***************
                                                            ;R2 CHANGED
                                                            ;R2 SHOULD STILL EQUAL THE CONTENTS OF "S2LN"
002460  020367  176166        66$:    CMP     R3,S2ADR        ;CHECK R3 UNCHANGED
002464  001401                        BEQ     67$
002466  104005                        ERROR   5               ;***************TEST 4 - ERROR 5***************
                                                            ;R3 CHANGED
                                                            ;R3 SHOULD STILL EQUAL THE CONTENTS OF "S2ADR"
002470  020467  176164        67$:    CMP     R4,FILL         ;CHECK  R4 UNCHANGED
002474  001401                        BEQ     68$
002476  104006                        ERROR   6               ;***************TEST 4 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL THE CONTENTS OF "FILL"
002500  020567  176152        68$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
```

```
 1085  002504  001401                          BEQ     69$
 1086  002506  104007                          ERROR   7               ;***************TEST 4 - ERROR 7***************
 1087                                                                  ;R5 CHANGED
 1088                                                                  ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
 1089  002510                            69$:
 1090  002510  016600  000002                   MOV     2(SP),R0        ;CHECK PSW AT TIME OF TRAP
 1091  002514  042700  177400                   BIC     #177400,R0
 1092  002520  020067  176154                   CMP     R0,EXPPSW
 1093  002524  001401                          BEQ     1$
 1094  002526  104010                          ERROR   10              ;***************TEST 4 - ERROR 10**************
 1095                                                                  ;PSW ERROR
 1096                                                                  ;EXPECTED PSW IS STORED AT "EXPPSW"
 1097                                                                  ;RESULTANT PSW IS IN R0
 1098  002530  021627  002424            1$:    CMP     (SP),#T4+2      ;CHECK ADDRESS OF TRAP
 1099  002534  001403                          BEQ     2$
 1100  002536  011637  000522                   MOV     (SP),@#$BDADR   ;STORE BAD ADDRESS
 1101  002542  104011                          ERROR   11              ;***************TEST 4 - ERROR 11**************
 1102                                                                  ;TRAP ADDRESS ERROR
 1103                                                                  ;EXPECTED ADDRESS IS "T4+2"
 1104                                                                  ;RESULTANT ADDRESS IS STORED AT "$BDADR"
 1105  002544  010600                    2$:    MOV     SP,R0           ;CHECK SP RESTORATION
 1106  002546  062700  000004                   ADD     #4,R0
 1107  002552  020037  000702                   CMP     R0,@#SAVR6
 1108  002556  001401                          BEQ     3$
 1109  002560  104012                          ERROR   12              ;***************TEST 4 - ERROR 12**************
 1110                                                                  ;STACK POINTER WAS NOT RESTORED
 1111                                                                  ;EXPECTED SP VALUE IS STORED AT "SAVR6"
 1112                                                                  ;ERRONEOUS SO VALUE IS AT "BADR6"
 1113  002562  012716  002600            3$:    MOV     #ENDT4,(SP)     ;RESTORE SP & PSW
 1114  002566  013766  000700  000002           MOV     @#EXPPSW,2(SP)
 1115  002574  000002                          RTI
 1116
 1117  002576                            S1T4:                         ;SOURCE1 STRING
 1118  002576      060                          .BYTE   60              ;MOST SIGNIFICANT DIGIT
 1119  002577                            S2T4:                         ;SOURCE2 STRING
 1120  002577      060                          .BYTE   60              ;MOST SIGNIFICANT DIGIT
 1121                                           .EVEN
 1122
 1123  002600  016737  176106  000010  ENDT4:  MOV     TEMP1,@#10      ;RESTORE TIMEOUT VECTOR CONTENTS
 1124  002606  016737  176102  000012          MOV     TEMP2,@#12
```

```
                                        ;;*****************************************************************
                                        ;*TEST 5        TEST "ADDN" BY ADDING TWO ZEROES WITH ZERO DESTINATION LENGTH
                                        ;;*****************************************************************
002614  000004                TST5:   SCOPE
002616  004567  012110                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
002622  000001                                  1               ;SOURCE1 LENGTH
002624  002772                                  S1T5            ;SOURCE1 ADDRESS
002626  000001                                  1               ;SOURCE2 LENGTH
002630  002773                                  S2T5            ;SOURCE2 ADDRESS
002632  000000                                  0               ;DESTINATION LENGTH
002634  004767  012164                JSR     PC,CLBUF        ;CLEAR BUFFER AREA
002640  004567  012200                JSR     R5,XPSW
002644  000204                        .WORD   204
002646  004767  012106                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
002652  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
002654  000244                        CLZ
002656  076050                        ADDN

002660  106767  176012                MFPS    CCODES          ;STORE RESULTANT PSW
002664  042767  177400  176004        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
002672  023767  000700  175776        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
002700  001401                        BEQ     64$             ;BR, IF EQUAL
002702  104001                        ERROR   1               ;***************TEST 5 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
002704                          64$:
002704  005700                        TST     R0              ;CHECK R0=0
002706  001401                        BEQ     65$
002710  104002                        ERROR   2               ;***************TEST 5 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
002712  005701                  65$:  TST     R1              ;CHECK R1=0
002714  001401                        BEQ     66$
002716  104003                        ERROR   3               ;***************TEST 5 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
002720  005702                  66$:  TST     R2              ;CHECK R2=0
002722  001401                        BEQ     67$
002724  104004                        ERROR   4               ;***************TEST 5 - ERROR 4***************
                                                            ;R2 SHOULD BE ZERO
002726  005703                  67$:  TST     R3              ;CHECK R3=0
002730  001401                        BEQ     68$
002732  104005                        ERROR   5               ;***************TEST 5 - ERROR 5***************
                                                            ;R3 SHOULD BE ZERO
002734  020467  175714          68$:  CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
002740  001401                        BEQ     69$
002742  104006                        ERROR   6               ;***************TEST 5 - ERROR 6***************
                                                            ;R4 SHOULD STILL BE DESTINATION LENGTH
002744  020567  175706          69$:  CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
002750  001401                        BEQ     70$
002752  104007                        ERROR   7               ;***************TEST 5 - ERROR 7***************
                                                            ;R5 SHOULD STILL BE DESTINATION ADDRESS
002754  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
002760  001403                        BEQ     71$             ;BR IF OK
002762  010637  000704                MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

E03


```
 1181  002766  104010                  ERROR   10              ;***************TEST 5 - ERROR 10***************
 1182                                                          ;STACK POINTER NOT RESTORED BY INSTRUCTION
 1183                                                          ;EXPECTED SP IS STORED AT "SAVR6"
 1184                                                          ;ERRONEOUS SP VALUE IS AT "BADR6"
 1185  002770                  71$:
 1186  002770  000431                 BR      TST6            ;BR TO NEXT TEST
 1187  002772                  S1T5:                           ;SOURCE1 STRING
 1188  002772     060                  .BYTE   60              ;MOST SIGNIFICANT DIGIT
 1189  002773                  S2T5:                           ;SOURCE2 STRING
 1190  002773     060                  .BYTE   60              ;MOST SIGNIFICANT DIGIT
 1191
 1192                                  .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 6        TEST "ADDN" WITH POSITIVE OPERANDS,SRC1 LENGTH .GT. SRC2 LENGTH, DL = NC
                                        ;;*****************************************************************
002774  000004                  TST6:   SCOPE
002776  004567  011730                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
003002  000004                          4                       ;SOURCE1 LENGTH
003004  003176                          S1T6                    ;SOURCE1 ADDRESS
003006  000002                          2                       ;SOURCE2 LENGTH
003010  003202                          S2T6                    ;SOURCE2 ADDRESS
003012  000002                          2                       ;DESTINATION LENGTH
003014  004767  012004                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
003020  004567  012020                  JSR     R5,XPSW
003024  000200                          .WORD   200
003026  004767  011726                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
003032  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
003034  076050                          ADDN

003036  106767  175634                  MFPS    CCODES          ;STORE RESULTANT PSW
003042  042767  177400  175626          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
003050  023767  000700  175620          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
003056  001401                          BEQ     64$             ;BR, IF EQUAL
003060  104001                          ERROR   1               ;***************TEST 6 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"

003062                          64$:
003062  005700                          TST     R0              ;CHECK R0=0
003064  001401                          BEQ     65$
003066  104002                          ERROR   2               ;***************TEST 6 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
003070  005701                  65$:    TST     R1              ;CHECK R1=0
003072  001401                          BEQ     66$
003074  104003                          ERROR   3               ;***************TEST 6 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
003076  005702                  66$:    TST     R2              ;CHECK R2=0
003100  001401                          BEQ     67$
003102  104004                          ERROR   4               ;***************TEST 6 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
003104  005703                  67$:    TST     R3              ;CHECK R3=0
003106  001401                          BEQ     68$
003110  104005                          ERROR   5               ;***************TEST 6 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
003112  020467  175536          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
003116  001401                          BEQ     69$
003120  104006                          ERROR   6               ;***************TEST 6 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
003122  020567  175530          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
003126  001401                          BEQ     70$
003130  104007                          ERROR   7               ;***************TEST 6 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
003132  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
003136  001403                          BEQ     71$             ;BR IF OK
003140  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1249  003144  104010                        ERROR   10              ;***************TEST 6 - ERROR 10***************
1250                                                                ;STACK POINTER NOT RESTORED BY INSTRUCTION
1251                                                                ;EXPECTED SP IS STORED AT "SAVR6"
1252                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
1253  003146                        71$:                            
1254                                                                ;CHECK ANSWER
1255  003146  012700  003204               MOV     #ANS6,R0        ;POINT R0 TO EXPECTED ANSWER
1256  003152  016701  175500               MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
1257  003156  016702  175472               MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
1258  003162  122021                72$:   CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
1259  003164  001401                       BEQ     73$             ;BR IF EQUAL
1260  003166  104011                       ERROR   11              ;***************TEST 6 - ERROR 11***************
1261                                                                ;ERRONEOUS ANSWER
1262                                                                ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1263                                                                ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1264  003170  005302                73$:   DEC     R2              ;DECREMENT ANSWER LENGTH
1265  003172  001373                       BNE     72$             ;BR IF NOT FINISHED
1266  003174  000404                       BR      TST7            ;BR TO NEXT TEST
1267  003176                        S1T6:                           ;SOURCE1 STRING
1268  003176     060                       .BYTE   60              ;MOST SIGNIFICANT DIGIT
1269  003177     060                       .BYTE   60
1270  003200     062                       .BYTE   62
1271  003201     061                       .BYTE   61
1272  003202                        S2T6:                           ;SOURCE2 STRING
1273  003202     067                       .BYTE   67              ;MOST SIGNIFICANT DIGIT
1274  003203     070                       .BYTE   70
1275  003204                        ANS6:                           ;EXPECTED ANSWER
1276  003204     071                       .BYTE   71
1277  003205     071                       .BYTE   71
1278                                       .EVEN
1279
```

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1280
1281
1282                                    ;;*****************************************************************
1283                                    ;*TEST 7        TEST "ADDN" WITH NEGATIVE OPERANDS, S2L .GT. S1L, NO OVERFLOW
1284                                    ;;*****************************************************************
1285  003206  000004                   TST7:   SCOPE
1286  003210  004567  011516                   JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
1287  003214  000002                           2                       ;SOURCE1 LENGTH
1288  003216  003412                           S1T7                    ;SOURCE1 ADDRESS
1289  003220  000004                           4                       ;SOURCE2 LENGTH
1290  003222  003414                           S2T7                    ;SOURCE2 ADDRESS
1291  003224  000004                           4                       ;DESTINATION LENGTH
1292  003226  004767  011572                   JSR     PC,CLBUF        ;CLEAR BUFFER AREA
1293  003232  004567  011606                   JSR     R5,XPSW
1294  003236  000210                           .WORD   210
1295  003240  004767  011514                   JSR     PC,GENR         ;SET UP GENERAL REGISTERS
1296  003244  000277                           SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
1297  003246  000250                           CLN
1298  003250  076050                           ADDN
1299
1300  003252  106767  175420                   MFPS    CCODES          ;STORE RESULTANT PSW
1301  003256  042767  177400  175412           BIC     #177400,CCODES  ;CLEAR UNUSED BITS
1302  003264  023767  000700  175404           CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
1303  003272  001401                           BEQ     64$             ;BR, IF EQUAL
1304  003274  104001                           ERROR   1               ;***************TEST 7 - ERROR 1***************
1305                                                                   ;PSW ERROR
1306                                                                   ;EXPECTED PSW IS STORED AT "SAVR6"
1307                                                                   ;ERRONEOUS SP VALJE IS AT "BADR6"
1308  003276                           64$:
1309  003276  005700                           TST     R0              ;CHECK R0=0
1310  003300  001401                           BEQ     65$
1311  003302  104002                           ERROR   2               ;***************TEST 7 - ERROR 2***************
1312                                                                   ;R0 SHOULD BE ZERO
1313  003304  005701                   65$:    TST     R1              ;CHECK R1=0
1314  003306  001401                           BEQ     66$
1315  003310  104003                           ERROR   3               ;***************TEST 7 - ERROR 3***************
1316                                                                   ;R1 SHOULD BE ZERO
1317  003312  005702                   66$:    TST     R2              ;CHECK R2=0
1318  003314  001401                           BEQ     67$
1319  003316  104004                           ERROR   4               ;***************TEST 7 - ERROR 4***************
1320                                                                   ;R2 SHOULD BE ZERO
1321  003320  005703                   67$:    TST     R3              ;CHECK R3=0
1322  003322  001401                           BEQ     68$
1323  003324  104005                           ERROR   5               ;***************TEST 7 - ERROR 5***************
1324                                                                   ;R3 SHOULD BE ZERO
1325  003326  020467  175322           68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
1326  003332  001401                           BEQ     69$
1327  003334  104006                           ERROR   6               ;***************TEST 7 - ERROR 6***************
1328                                                                   ;R4 SHOULD STILL BE DESTINATION LENGTH
1329  003336  020567  175314           69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
1330  003342  001401                           BEQ     70$
1331  003344  104007                           ERROR   7               ;***************TEST 7 - ERROR 7***************
1332                                                                   ;R5 SHOULD STILL BE DESTINATION ADDRESS
1333  003346  023706  000702           70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
1334  003352  001403                           BEQ     71$             ;BR IF OK
1335  003354  010637  000704                   MOV     SP,@#BADR6      ;COPY BAD SP VALJE
```

T7 TEST "ADDN" WITH NEGATIVE OPERANDS, S2L .GT. S1L, NO OVERFLOW SEQ 0036

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1336  003360  104010                  ERROR   10              ;****************TEST 7 - ERROR 10***************
1337                                                          ;STACK POINTER NOT RESTORED BY INSTRUCTION
1338                                                          ;EXPECTED SP IS STORED AT "SAVR6"
1339                                                          ;ERRONEOUS SP VALUE IS AT "BADR6"
1340  003362                  71$:
1341                                                          ;CHECK ANSWER
1342  003362  012700  003420          MOV     #ANS7,R0        ;POINT R0 TO EXPECTED ANSWER
1343  003366  016701  175264          MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
1344  003372  016702  175256          MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
1345  003376  122021          72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
1346  003400  001401                  BEQ     73$             ;BR IF EQUAL
1347  003402  104011                  ERROR   11              ;****************TEST 7 - ERROR 11***************
1348                                                          ;ERRONEOUS ANSWER
1349                                                          ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1350                                                          ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1351  003404  005302          73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
1352  003406  001373                  BNE     72$             ;BR IF NOT FINISHED
1353  003410  000405                  BR      TST10           ;BR TO NEXT TEST
1354  003412                  S1T7:                           ;SOURCE1 STRING
1355  003412     063                  .BYTE   63              ;MOST SIGNIFICANT DIGIT
1356  003413     165                  .BYTE   165
1357  003414                  S2T7:                           ;SOURCE2 STRING
1358  003414     060                  .BYTE   60              ;MOST SIGNIFICANT DIGIT
1359  003415     071                  .BYTE   71
1360  003416     066                  .BYTE   66
1361  003417     165                  .BYTE   165
1362  003420                  ANS7:                           ;EXPECTED ANSWER
1363  003420     061                  .BYTE   61              ;MOST SIGNIFICANT DIGIT
1364  003421     060                  .BYTE   60
1365  003422     060                  .BYTE   60
1366  003423     160                  .BYTE   160
1367
1368                                  .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 10       TEST "ADDN" WITH NEGATIVE OPERANDS, OVERFLOW
                                        ;;*****************************************************************
003424  000004                  TST10:  SCOPE
003426  004567  011300                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
003432  000004                          4                       ;SOURCE1 LENGTH
003434  003630                          S1T10                   ;SOURCE1 ADDRESS
003436  000002                          2                       ;SOURCE2 LENGTH
003440  003634                          S2T10                   ;SOURCE2 ADDRESS
003442  000002                          2                       ;DESTINATION LENGTH
003444  004767  011354                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
003450  004567  011370                  JSR     R5,XPSW
003454  000212                          .WORD   212
003456  004767  011276                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
003462  000265                          +SEZ!SEC                        ;SET UP THE COMPLEMENT OF EXPECTED CC'S
003464  000252                          +CLN!CLV
003466  076050                          ADDN

003470  106767  175202                  MFPS    CCODES          ;STORE RESULTANT PSW
003474  042767  177400  175174          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
003502  023767  000700  175166          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
003510  001401                          BEQ     64$             ;BR, IF EQUAL
003512  104001                          ERROR   1               ;***************TEST 10 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR5"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
003514                          64$:
003514  005700                          TST     R0              ;CHECK R0=0
003516  001401                          BEQ     65$
003520  104002                          ERROR   2               ;***************TEST 10 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
003522  005701                  65$:    TST     R1              ;CHECK R1=0
003524  001401                          BEQ     66$
003526  104003                          ERROR   3               ;***************TEST 10 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
003530  005702                  66$:    TST     R2              ;CHECK R2=0
003532  001401                          BEQ     67$
003534  104004                          ERROR   4               ;***************TEST 10 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
003536  005703                  67$:    TST     R3              ;CHECK R3=0
003540  001401                          BEQ     68$
003542  104005                          ERROR   5               ;***************TEST 10 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
003544  020467  175104          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
003550  001401                          BEQ     69$
003552  104006                          ERROR   6               ;***************TEST 10 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
003554  020567  175076          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
003560  001401                          BEQ     70$
003562  104007                          ERROR   7               ;***************TEST 10 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
003564  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
003570  001403                          BEQ     71$             ;BR IF OK
003572  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1425  003576  104010                          ERROR   10              ;***************TEST 10 - ERROR 10***************
1426                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
1427                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
1428                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
1429  003600                          71$:                            
1430                                                                  ;CHECK ANSWER
1431  003600  012700  003636                  MOV     #ANS10,R0       ;POINT R0 TO EXPECTED ANSWER
1432  003604  016701  175046                  MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
1433  003610  016702  175040                  MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
1434  003614  122021                  72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
1435  003616  001401                          BEQ     73$             ;BR IF EQUAL
1436  003620  104011                          ERROR   11              ;***************TEST 10 - ERROR 11***************
1437                                                                  ;ERRONEOUS ANSWER
1438                                                                  ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1439                                                                  ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1440  003622  005302                  73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
1441  003624  001373                          BNE     72$             ;BR IF NOT FINISHED
1442  003626  000404                          BR      TST11           ;BR TO NEXT TEST
1443  003630                          S1T10:                          ;SOURCE1 STRING
1444  003630     060                          .BYTE   60              ;MOST SIGNIFICANT DIGIT
1445  003631     061                          .BYTE   61
1446  003632     062                          .BYTE   62
1447  003633     163                          .BYTE   163
1448  003634                          S2T10:                          ;SOURCE2 STRING
1449  003634     065                          .BYTE   65              ;MOST SIGNIFICANT DIGIT
1450  003635     164                          .BYTE   164
1451  003636                          ANS10:                          ;EXPECTED ANSWER
1452  003636     067                          .BYTE   67              ;MOST SIGNIFICANT DIGIT
1453  003637     167                          .BYTE   167
1454
1455                                          .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 11       TEST "ADDN" WITH POSITIVE OPERANDS, S2L=S1L,OVERFLOW
                                        ;;*****************************************************************
003640  000004                  TST11:  SCOPE
003642  004567  011064                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
003646  000002                          2                       ;SOURCE1 LENGTH
003650  004044                          S1T11                   ;SOURCE1 ADDRESS
003652  000002                          2                       ;SOURCE2 LENGTH
003654  004046                          S2T11                   ;SOURCE2 ADDRESS
003656  000002                          2                       ;DESTINATION LENGTH
003660  004767  011140                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
003664  004567  011154                  JSR     R5,XPSW
003670  000206                          .WORD   206
003672  004767  011062                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
003676  000271                          +SEN!SEC                        ;SET UP THE COMPLEMENT OF EXPECTED CC'S
003700  000246                          +CLZ!CLV
003702  076050                          ADDN

003704  106767  174766                  MFPS    CCODES          ;STORE RESULTANT PSW
003710  042767  177400  174760          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
003716  023767  000700  174752          CMP     @#EXPPSW.CCODES ;CHECK PSW AGAINST EXPECTED VALUE
003724  001401                          BEQ     64$             ;BR, IF EQUAL
003726  104001                          ERROR   1               ;***************TEST 11 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
003730                          64$:
003730  005700                          TST     R0              ;CHECK R0=0
003732  001401                          BEQ     65$
003734  104002                          ERROR   2               ;***************TEST 11 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
003736  005701                  65$:    TST     R1              ;CHECK R1=0
003740  001401                          BEQ     66$
003742  104003                          ERROR   3               ;***************TEST 11 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
003744  005702                  66$:    TST     R2              ;CHECK R2=0
003746  001401                          BEQ     67$
003750  104004                          ERROR   4               ;***************TEST 11 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
003752  005703                  67$:    TST     R3              ;CHECK R3=0
003754  001401                          BEQ     68$
003756  104005                          ERROR   5               ;***************TEST 11 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
003760  020467  174670          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
003764  001401                          BEQ     69$
003766  104006                          ERROR   6               ;***************TEST 11 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
003770  020567  174662          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
003774  001401                          BEQ     70$
003776  104007                          ERROR   7               ;***************TEST 11 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
004000  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
004004  001403                          BEQ     71$             ;BR IF OK
004006  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1512  004012  104010                  ERROR   10              ;***************TEST 11 - ERROR 10***************
1513                                                          ;STACK POINTER NOT RESTORED BY INSTRUCTION
1514                                                          ;EXPECTED SP IS STORED AT "SAVR6"
1515                                                          ;ERRONEOUS SP VALUE IS AT "BADR6"
1516  004014                  71$:                            ;CHECK ANSWER
1517
1518  004014  012700  004050          MOV     #ANS11,R0       ;POINT R0 TO EXPECTED ANSWER
1519  004020  016701  174632          MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
1520  004024  016702  174624          MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
1521  004030  122021          72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
1522  004032  001401                  BEQ     73$             ;BR IF EQUAL
1523  004034  104011                  ERROR   11              ;***************TEST 11 - ERROR 11***************
1524                                                          ;ERRONEOUS ANSWER
1525                                                          ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1526                                                          ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1527  004036  005302          73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
1528  004040  001373                  BNE     72$             ;BR IF NOT FINISHED
1529  004042  000403                  BR      TST12           ;BR TO NEXT TEST
1530  004044                  S1T11:                          ;SOURCE1 STRING
1531  004044      063                 .BYTE   63              ;MOST SIGNIFICANT DIGIT
1532  004045      062                 .BYTE   62
1533  004046                  S2T11:                          ;SOURCE2 STRING
1534  004046      066                 .BYTE   66              ;MOST SIGNIFICANT DIGIT
1535  004047      070                 .BYTE   70
1536  004050                  ANS11:                          ;EXPECTED ANSWER
1537  004050      060                 .BYTE   60
1538  004051      060                 .BYTE   60
1539
1540                          .EVEN
```

```
1541
1542
1543                                    ;;*****************************************************************
1544                                    ;*TEST 12       TEST ADDN WITH NEGATIVE OPERANDS, S2L=S1L,OVERFLOW CARRY
1545                                    ;;*****************************************************************
1546  004052  000004                    T12:  SCOPE
1547  004054  004567  010652                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
1548  004060  000002                          2                       ;SOURCE1 LENGTH
1549  004062  004256                          S1T12                   ;SOURCE1 ADDRESS
1550  004064  000002                          2                       ;SOURCE2 LENGTH
1551  004066  004260                          S2T12                   ;SOURCE2 ADDRESS
1552  004070  000001                          1                       ;DESTINATION LENGTH
1553  004072  004767  010726                JSR     PC,CLBUF        ;CLEAR BUFFER AREA
1554  004076  004567  010742                JSR     R5,XPSW
1555  004102  000212                        .WORD   212
1556  004104  004767  010650                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
1557  004110  000265                        +SEZ!SEC                        ;SET UP THE COMPLEMENT OF EXPECTED CC'S
1558  004112  000252                        +CLN!CLV
1559  004114  076050                        ADDN
1560
1561  004116  106767  174554                MFPS    CCODES          ;STORE RESULTANT PSW
1562  004122  042767  177400  174546        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
1563  004130  023767  000700  174540        CMP     @#EXPPSW.CCODES ;CHECK PSW AGAINST EXPECTED VALUE
1564  004136  001401                        BEQ     64$             ;BR, IF EQUAL
1565  004140  104001                        ERROR   1               ;***************TEST 12 - ERROR 1***************
1566                                                                ;PSW ERROR
1567                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
1568                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
1569  004142                          64$:
1570  004142  005700                        TST     R0              ;CHECK R0=0
1571  004144  001401                        BEQ     65$
1572  004146  104002                        ERROR   2               ;***************TEST 12 - ERROR 2***************
1573                                                                ;R0 SHOULD BE ZERO
1574  004150  005701                  65$:  TST     R1              ;CHECK R1=0
1575  004152  001401                        BEQ     66$
1576  004154  104003                        ERROR   3               ;***************TEST 12 - ERROR 3***************
1577                                                                ;R1 SHOULD BE ZERO
1578  004156  005702                  66$:  TST     R2              ;CHECK R2=0
1579  004160  001401                        BEQ     67$
1580  004162  104004                        ERROR   4               ;***************TEST 12 - ERROR 4***************
1581                                                                ;R2 SHOULD BE ZERO
1582  004164  005703                  67$:  TST     R3              ;CHECK R3=0
1583  004166  001401                        BEQ     68$
1584  004170  104005                        ERROR   5               ;***************TEST 12 - ERROR 5***************
1585                                                                ;R3 SHOULD BE ZERO
1586  004172  020467  174456          68$:  CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
1587  004176  001401                        BEQ     69$
1588  004200  104006                        ERROR   6               ;***************TEST 12 - ERROR 6***************
1589                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
1590  004202  020567  174450          69$:  CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
1591  004206  001401                        BEQ     70$
1592  004210  104007                        ERROR   7               ;***************TEST 12 - ERROR 7***************
1593                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
1594  004212  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
1595  004216  001403                        BEQ     71$             ;BR IF OK
1596  004220  010637  000704                MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1597  004224  104010                        ERROR   10              ;****************TEST 12 - ERROR 10****************
1598                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
1599                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
1600                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
1601  004226                        71$:
1602                                                                  ;CHECK ANSWER
1603  004226  012700  004262                MOV     #ANS12,R0       ;POINT R0 TO EXPECTED ANSWER
1604  004232  016701  174420                MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
1605  004236  016702  174412                MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
1606  004242  122021                72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
1607  004244  001401                        BEQ     73$             ;BR IF EQUAL
1608  004246  104011                        ERROR   11              ;****************TEST 12 - ERROR 11****************
1609                                                                  ;ERRONEOUS ANSWER
1610                                                                  ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1611                                                                  ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1612  004250  005302                73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
1613  004252  001373                        BNE     72$             ;BR IF NOT FINISHED
1614  004254  000403                        BR      TST13           ;BR TO NEXT TEST
1615  004256                        S1T12:                          ;SOURCE1 STRING
1616  004256     066                        .BYTE   66              ;MOST SIGNIFICANT DIGIT
1617  004257     161                        .BYTE   161
1618  004260                        S2T12:                          ;SOURCE2 STRING
1619  004260     064                        .BYTE   64              ;MOST SIGNIFICANT DIGIT
1620  004261     165                        .BYTE   165
1621  004262                        ANS12:                          ;EXPECTED ANSWER
1622  004262     166                        .BYTE   166
1623
1624          004264                        .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 13       TEST "ADDN" WITH +SRC1 & -SRC2, ZERO RESULT
                                        ;;*****************************************************************
004264  000004                  TST13:  SCOPE
004266  004567  010440                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
004272  000001                          1                       ;SOURCE1 LENGTH
004274  004442                          S1T13                   ;SOURCE1 ADDRESS
004276  000001                          1                       ;SOURCE2 LENGTH
004300  004443                          S2T13                   ;SOURCE2 ADDRESS
004302  000000                          0                       ;DESTINATION LENGTH
004304  004767  010514                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
004310  004567  01053C                  JSR     R5,XPSW
004314  000204                          .WORD   204
004316  004767  010436                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
004322  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
004324  000244                          CLZ
004326  076050                          ADDN

004330  106767  174342                  MFPS    CCODES          ;STORE RESULTANT PSW
004334  042767  177400  174334          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
004342  023767  000700  174326          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
004350  001401                          BEQ     64$             ;BR, IF EQUAL
004352  104001                          ERROR   1               ;***************TEST 13 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
004354                          64$:
004354  005700                          TST     R0              ;CHECK R0=0
004356  001401                          BEQ     65$
004360  104002                          ERROR   2               ;***************TEST 13 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
004362  005701                  65$:    TST     R1              ;CHECK R1=0
004364  001401                          BEQ     66$
004366  104003                          ERROR   3               ;***************TEST 13 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
004370  005702                  66$:    TST     R2              ;CHECK R2=0
004372  001401                          BEQ     67$
004374  104004                          ERROR   4               ;***************TEST 13 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
004376  005703                  67$:    TST     R3              ;CHECK R3=0
004400  001401                          BEQ     68$
004402  104005                          ERROR   5               ;***************TEST 13 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
004404  020467  174244          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
004410  001401                          BEQ     69$
004412  104006                          ERROR   6               ;***************TEST 13 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
004414  020567  174236          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
004420  001401                          BEQ     70$
004422  104007                          ERROR   7               ;***************TEST 13 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
004424  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
004430  001403                          BEQ     71$             ;BR IF OK
004432  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1681  004436  104010                  ERROR   10              ;***************TEST 13 - ERROR 10***************
1682                                                          ;STACK POINTER NOT RESTORED BY INSTRUCTION
1683                                                          ;EXPECTED SP IS STORED AT "SAVR6"
1684                                                          ;ERRONEOUS SP VALUE IS AT "BADR6"
1685  004440                  71$:
1686  004440  000401                 BR      TST14           ;BR TO NEXT TEST
1687  004442                  S1T13:                          ;SOURCE1 STRING
1688  004442     063                  .BYTE   63              ;MOST SIGNIFICANT DIGIT
1689  004443                  S2T13:                          ;SOURCE2 STRING
1690  004443     163                  .BYTE   163             ;MOST SIGNIFICANT DIGIT
1691
1692                                  .EVEN
```

```
                                ;;*****************************************************************
                                ;*TEST 14       TEST "ADDN" WITH -SRC1 & +SRC2, S1L .LT. S2L, /S2/ .GT. /S1/
                                ;;*****************************************************************
004444  000004                  TST14:  SCOPE
004446  004567  010260                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
004452  000003                          3                       ;SOURCE1 LENGTH
004454  004650                          S1T14                   ;SOURCE1 ADDRESS
004456  000004                          4                       ;SOURCE2 LENGTH
004460  004653                          S2T14                   ;SOURCE2 ADDRESS
004462  000002                          2                       ;DESTINATION LENGTH
004464  004767  010334                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
004470  004567  010350                  JSR     R5,XPSW
004474  000210                          .WORD   210
004476  004767  010256                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
004502  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
004504  000250                          CLN
004506  076050                          ADDN

004510  106767  174162                  MFPS    CCODES          ;STORE RESULTANT PSW
004514  042767  177400  174154          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
004522  023767  000700  174146          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
004530  001401                          BEQ     64$             ;BR, IF EQUAL
004532  104001                          ERROR   1               ;***************TEST 14 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALJE IS AT "BADR6"

004534                          64$:
004534  005700                          TST     R0              ;CHECK R0=0
004536  001401                          BEQ     65$
004540  104002                          ERROR   2               ;***************TEST 14 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
004542  005701                  65$:    TST     R1              ;CHECK R1=0
004544  001401                          BEQ     66$
004546  104003                          ERROR   3               ;***************TEST 14 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
004550  005702                  66$:    TST     R2              ;CHECK R2=0
004552  001401                          BEQ     67$
004554  104004                          ERROR   4               ;***************TEST 14 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
004556  005703                  67$:    TST     R3              ;CHECK R3=0
004560  001401                          BEQ     68$
004562  104005                          ERROR   5               ;***************TEST 14 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
004564  020467  174064          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
004570  001401                          BEQ     69$
004572  104006                          ERROR   6               ;***************TEST 14 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
004574  020567  174056          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
004600  001401                          BEQ     70$
004602  104007                          ERROR   7               ;***************TEST 14 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
004604  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
004610  001403                          BEQ     71$             ;BR IF OK
004612  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALJE
```

```
 1749  004616  104010                        ERROR   10              ;****************TEST 14 - ERROR 10****************
 1750                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
 1751                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
 1752                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
 1753  004620                        71$:                              ;CHECK ANSWER
 1754
 1755  004620  012700  004657                MOV     #ANS14,R0       ;POINT R0 TO EXPECTED ANSWER
 1756  004624  016701  174026                MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
 1757  004630  016702  174020                MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
 1758  004634  122021                72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
 1759  004636  001401                        BEQ     73$             ;BR IF EQUAL
 1760  004640  104011                        ERROR   11              ;****************TEST 14 - ERROR 11****************
 1761                                                                  ;ERRONEOUS ANSWER
 1762                                                                  ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
 1763                                                                  ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
 1764  004642  005302                73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
 1765  004644  001373                        BNE     72$             ;BR IF NOT FINISHED
 1766  004646  000405                        BR      TST15           ;BR TO NEXT TEST
 1767  004650                        S1T14:                          ;SOURCE1 STRING
 1768  004650     067                        .BYTE   67              ;MOST SIGNIFICANT DIGIT
 1769  004651     066                        .BYTE   66
 1770  004652     064                        .BYTE   64
 1771  004653                        S2T14:                          ;SOURCE2 STRING
 1772  004653     060                        .BYTE   60              ;MOST SIGNIFICANT DIGIT
 1773  004654     070                        .BYTE   70
 1774  004655     063                        .BYTE   63
 1775  004656     171                        .BYTE   171
 1776  004657                        ANS14:                          ;EXPECTED ANSWER
 1777  004657     067                        .BYTE   67              ;MOST SIGNIFICANT DIGIT
 1778  004660     165                        .BYTE   165
 1779
 1780  004662                                .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 15       TEST "ADDN" WITH +SRC1 & -SRC2, S1L .GT. S2L, /S2 .GT. /S1/, OVERFLOW
                                        ;;*****************************************************************
004662  000004                        TST15:  SCOPE
004664  004567  010042                        JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
004670  000004                                4               ;SOURCE1 LENGTH
004672  005066                                S1T15           ;SOURCE1 ADDRESS
004674  000003                                3               ;SOURCE2 LENGTH
004676  005072                                S2T15           ;SOURCE2 ADDRESS
004700  000002                                2               ;DESTINATION LENGTH
004702  004767  010116                        JSR     PC,CLBUF        ;CLEAR BUFFER AREA
004706  004567  010132                        JSR     R5,XPSW
004712  000206                                .WORD   206
004714  004767  010040                        JSR     PC,GENR         ;SET UP GENERAL REGISTERS
004720  000271                                +SEN!SEC                ;SET UP THE COMPLEMENT OF EXPECTED CC'S
004722  000246                                +CLZ!CLV
004724  076050                                ADDN

004726  106767  173744                        MFPS    CCODES          ;STORE RESULTANT PSW
004732  042767  177400  173736                BIC     #177400,CCODES  ;CLEAR UNUSED BITS
004740  023767  000700  173730                CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
004746  001401                                BEQ     64$             ;BR, IF EQUAL
004750  104001                                ERROR   1               ;**************TEST 15 - ERROR 1***************
                                                                        ;PSW ERROR
                                                                        ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                        ;ERRONEOUS SP VALUE IS AT "BADR6"
004752                                  64$:
004752  005700                                TST     R0              ;CHECK R0=0
004754  001401                                BEQ     65$
004756  104002                                ERROR   2               ;***************TEST 15 - ERROR 2***************
                                                                        ;R0 SHOULD BE ZERO
004760  005701                          65$:  TST     R1              ;CHECK R1=0
004762  001401                                BEQ     66$
004764  104003                                ERROR   3               ;***************TEST 15 - ERROR 3***************
                                                                        ;R1 SHOULD BE ZERO
004766  005702                          66$:  TST     R2              ;CHECK R2=0
004770  001401                                BEQ     67$
004772  104004                                ERROR   4               ;***************TEST 15 - ERROR 4***************
                                                                        ;R2 SHOULD BE ZERO
004774  005703                          67$:  TST     R3              ;CHECK R3=0
004776  001401                                BEQ     68$
005000  104005                                ERROR   5               ;***************TEST 15 - ERROR 5***************
                                                                        ;R3 SHOULD BE ZERO
005002  020467  173646                  68$:  CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
005006  001401                                BEQ     69$
005010  104006                                ERROR   6               ;***************TEST 15 - ERROR 6***************
                                                                        ;R4 SHOULD STILL BE DESTINATION LENGTH
005012  020567  173640                  69$:  CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
005016  001401                                BEQ     70$
005020  104007                                ERROR   7               ;***************TEST 15 - ERROR 7***************
                                                                        ;R5 SHOULD STILL BE DESTINATION ADDRESS
005022  023706  000702                  70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
005026  001403                                BEQ     71$             ;BR IF OK
005030  010637  000704                        MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1837  005034  104010                    ERROR   10              ;***************TEST 15 - ERROR 10***************
1838                                                            ;STACK POINTER NOT RESTORED BY INSTRUCTION
1839                                                            ;EXPECTED SP IS STORED AT "SAVR6"
1840                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
1841  005036                    71$:
1842                                                            ;CHECK ANSWER
1843  005036  012700  005075            MOV     #ANS15,R0       ;POINT R0 TO EXPECTED ANSWER
1844  005042  016701  173610            MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
1845  005046  016702  173602            MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
1846  005052  122021            72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
1847  005054  001401                    BEQ     73$             ;BR IF EQUAL
1848  005056  104011                    ERROR   11              ;***************TEST 15 - ERROR 11***************
1849                                                            ;ERRONEOUS ANSWER
1850                                                            ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1851                                                            ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1852  005060  005302            73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
1853  005062  001373                    BNE     72$             ;BR IF NOT FINISHED
1854  005064  000405                    BR      TST16           ;BR TO NEXT TEST
1855  005066                    S1T15:                          ;SOURCE1 STRING
1856  005066     060                    .BYTE   60              ;MOST SIGNIFICANT DIGIT
1857  005067     060                    .BYTE   60
1858  005070     067                    .BYTE   67
1859  005071     163                    .BYTE   163
1860  005072                    S2T15:                          ;SOURCE2 STRING
1861  005072     061                    .BYTE   61              ;MOST SIGNIFICANT DIGIT
1862  005073     067                    .BYTE   67
1863  005074     063                    .BYTE   63
1864  005075                    ANS15:                          ;EXPECTED ANSWER
1865  005075     060                    .BYTE   60              ;MOST SIGNIFICANT DIGIT
1866  005076     060                    .BYTE   60
1867
1868          005100                    .EVEN
1869
```

```
1870
1871
1872                                    ;;*****************************************************************
1873                                    ;*TEST 16       TEST ADDN WITH -SRC1 & +SRC2,S1L .LT. S2L, /S1/ .GT. /S2/,OVERFLOW
1874                                    ;;*****************************************************************
1875  005100  000004                   TST16:  SCOPE
1876  005102  004567  007624                   JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
1877  005106  000003                           3                       ;SOURCE1 LENGTH
1878  005110  005304                           S1T16                   ;SOURCE1 ADDRESS
1879  005112  000004                           4                       ;SOURCE2 LENGTH
1880  005114  005307                           S2T16                   ;SOURCE2 ADDRESS
1881  005116  000002                           2                       ;DESTINATION LENGTH
1882  005120  004767  007700                   JSR     PC,CLBUF        ;CLEAR BUFFER AREA
1883  005124  004567  007714                   JSR     R5,XPSW
1884  005130  000206                           .WORD   206
1885  005132  004767  007622                   JSR     PC,GENR         ;SET UP GENERAL REGISTERS
1886  005136  000271                           +SEN!SEC                        ;SET UP THE COMPLEMENT OF EXPECTED CC'S
1887  005140  000246                           +CLZ!CLV
1888  005142  076050                           ADDN
1889
1890  005144  106767  173526                   MFPS    CCODES          ;STORE RESULTANT PSW
1891  005150  042767  177400  173520          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
1892  005156  023767  000700  173512          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
1893  005164  001401                           BEQ     64$             ;BR, IF EQUAL
1894  005166  104001                           ERROR   1               ;***************TEST 16 - ERROR 1***************
1895                                                                   ;PSW ERROR
1896                                                                   ;EXPECTED PSW IS STORED AT "SAVR6"
1897                                                                   ;ERRONEOUS SP VALUE IS AT "BADR6"
1898  005170                           64$:
1899  005170  005700                           TST     R0              ;CHECK R0=0
1900  005172  001401                           BEQ     65$
1901  005174  104002                           ERROR   2               ;***************TEST 16 - ERROR 2***************
1902                                                                   ;R0 SHOULD BE ZERO
1903  005176  005701                   65$:    TST     R1              ;CHECK R1=0
1904  005200  001401                           BEQ     66$
1905  005202  104003                           ERROR   3               ;***************TEST 16 - ERROR 3***************
1906                                                                   ;R1 SHOULD BE ZERO
1907  005204  005702                   66$:    TST     R2              ;CHECK R2=0
1908  005206  001401                           BEQ     67$
1909  005210  104004                           ERROR   4               ;***************TEST 16 - ERROR 4***************
1910                                                                   ;R2 SHOULD BE ZERO
1911  005212  005703                   67$:    TST     R3              ;CHECK R3=0
1912  005214  001401                           BEQ     68$
1913  005216  104005                           ERROR   5               ;***************TEST 16 - ERROR 5***************
1914                                                                   ;R3 SHOULD BE ZERO
1915  005220  020467  173430          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
1916  005224  001401                           BEQ     69$
1917  005226  104006                           ERROR   6               ;***************TEST 16 - ERROR 6***************
1918                                                                   ;R4 SHOULD STILL BE DESTINATION LENGTH
1919  005230  020567  173422          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
1920  005234  001401                           BEQ     70$
1921  005236  104007                           ERROR   7               ;***************TEST 16 - ERROR 7***************
1922                                                                   ;R5 SHOULD STILL BE DESTINATION ADDRESS
1923  005240  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
1924  005244  001403                           BEQ     71$             ;BR IF OK
1925  005246  010637  000704                   MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
1926  005252  104010                  ERROR   10              ;***************TEST 16 - ERROR 10***************
1927                                                          ;STACK POINTER NOT RESTORED BY INSTRUCTION
1928                                                          ;EXPECTED SP IS STORED AT "SAVR6"
1929                                                          ;ERRONEOUS SP VALUE IS AT "BADR6"
1930  005254                      71$:
1931                                                          ;CHECK ANSWER
1932  005254  012700  005313              MOV     #ANS16,R0   ;POINT R0 TO EXPECTED ANSWER
1933  005260  016701  173372              MOV     DSTAD,R1    ;POINT R1 TO RESULTANT ANSWER
1934  005264  016702  173364              MOV     DSTLN,R2    ;STORE ANSWER LENGTH IN R1
1935  005270  122021              72$:    CMPB    (R0)+,(R1)+ ;COMPARE EACH DIGIT
1936  005272  001401                      BEQ     73$         ;BR IF EQUAL
1937  005274  104011                      ERROR   11          ;***************TEST 16 - ERROR 11***************
1938                                                          ;ERRONEOUS ANSWER
1939                                                          ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
1940                                                          ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
1941  005276  005302              73$:    DEC     R2          ;DECREMENT ANSWER LENGTH
1942  005300  001373                      BNE     72$         ;BR IF NOT FINISHED
1943  005302  000405                      BR      TST17       ;BR TO NEXT TEST
1944  005304                      S1T16:                      ;SOURCE1 STRING
1945  005304      061                     .BYTE   61          ;MOST SIGNIFICANT DIGIT
1946  005305      067                     .BYTE   67
1947  005306      162                     .BYTE   162
1948  005307                      S2T16:                      ;SOURCE2 STRING
1949  005307      060                     .BYTE   60          ;MOST SIGNIFICANT DIGIT
1950  005310      060                     .BYTE   60
1951  005311      067                     .BYTE   67
1952  005312      062                     .BYTE   62
1953  005313                      ANS16:                      ;EXPECTED ANSWER
1954  005313      060                     .BYTE   60          ;MOST SIGNIFICANT DIGIT
1955  005314      060                     .BYTE   60
1956
1957          005316                    .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 17       TEST ADDN WITH +SRC1 & -SRC2, S1L=S2L, /S1/ .GT./S2/,OVERFLOW
                                        ;;*****************************************************************
                                        ST17:   SCOPE
005320  004567  007406                          JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
005324  000003                                  3                       ;SOURCE1 LENGTH
005326  005522                                  S1T17                   ;SOURCE1 ADDRESS
005330  000003                                  3                       ;SOURCE2 LENGTH
005332  005525                                  S2T17                   ;SOURCE2 ADDRESS
005334  000002                                  2                       ;DESTINATION LENGTH
005336  004767  007462                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
005342  004567  007476                  JSR     R5,XPSW
005346  000202                          .WORD   202
005350  004767  007404                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
005354  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
005356  000242                          CLV
005360  076050                          ADDN

005362  106767  173310                  MFPS    CCODES          ;STORE RESULTANT PSW
005366  042767  177400  173302          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
005374  023767  000700  173274          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
005402  001401                          BEQ     64$             ;BR, IF EQUAL
005404  104001                          ERROR   1               ;***************TEST 17 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"

005406                          64$:
005406  005700                          TST     R0              ;CHECK R0=0
005410  001401                          BEQ     65$
005412  104002                          ERROR   2               ;***************TEST 17 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
005414  005701                  65$:    TST     R1              ;CHECK R1=0
005416  001401                          BEQ     66$
005420  104003                          ERROR   3               ;***************TEST 17 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
005422  005702                  66$:    TST     R2              ;CHECK R2=0
005424  001401                          BEQ     67$
005426  104004                          ERROR   4               ;***************TEST 17 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
005430  005703                  67$:    TST     R3              ;CHECK R3=0
005432  001401                          BEQ     68$
005434  104005                          ERROR   5               ;***************TEST 17 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
005436  020467  173212          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
005442  001401                          BEQ     69$
005444  104006                          ERROR   6               ;***************TEST 17 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
005446  020567  173204          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
005452  001401                          BEQ     70$
005454  104007                          ERROR   7               ;***************TEST 17 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
005456  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
005462  001403                          BEQ     71$             ;BR IF OK
005464  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALJE
```

```
005470  104010                          ERROR   10              ;***************TEST 17 - ERROR 10***************
                                                                ;STACK POINTER NOT RESTORED BY INSTRUCTION
                                                                ;EXPECTED SP IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
005472                          71$:
                                                                ;CHECK ANSWER
005472  012700  005530                  MOV     #ANS17,R0       ;POINT R0 TO EXPECTED ANSWER
005476  016701  173154                  MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
005502  016702  173146                  MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
005506  122021                  72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
005510  001401                          BEQ     73$             ;BR IF EQUAL
005512  104011                          ERROR   11              ;***************TEST 17 - ERROR 11***************
                                                                ;ERRONEOUS ANSWER
                                                                ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
                                                                ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
005514  005302                  73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
005516  001373                          BNE     72$             ;BR IF NOT FINISHED
005520  000404                          BR      TST20           ;BR TO NEXT TEST
005522                          S1T17:                          ;SOURCE1 STRING
005522     063                          .BYTE   63              ;MOST SIGNIFICANT DIGIT
005523     065                          .BYTE   65
005524     067                          .BYTE   67
005525                          S2T17:                          ;SOURCE2 STRING
005525     060                          .BYTE   60              ;MOST SIGNIFICANT DIGIT
005526     063                          .BYTE   63
005527     165                          .BYTE   165
005530                          ANS17:                          ;EXPECTED ANSWER
005530     062                          .BYTE   62              ;MOST SIGNIFICANT DIGIT
005531     062                          .BYTE   62

                                        .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 20       TEST ADDN WITH POSITIVE OPERANDS, OVERFLOW, NO CARRY OUT OF OVERFLOW
                                        ;;*****************************************************************
005532  000004                TST20:  SCOPE
005534  004567  007172                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
005540  000003                        3                       ;SOURCE1 LENGTH
005542  005736                        S1T20                   ;SOURCE1 ADDRESS
005544  000003                        3                       ;SOURCE2 LENGTH
005546  005741                        S2T20                   ;SOURCE2 ADDRESS
005550  000002                        2                       ;DESTINATION LENGTH
005552  004767  007246                JSR     PC,CLBUF        ;CLEAR BUFFER AREA
005556  004567  007262                JSR     R5,XPSW
005562  000202                        .WORD   202
005564  004767  007170                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
005570  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
005572  000242                        CLV
005574  076050                        ADDN

005576  106767  173074                MFPS    CCODES          ;STORE RESULTANT PSW
005602  042767  177400  173066        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
005610  023767  000700  173060        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
005616  001401                        BEQ     64$             ;BR, IF EQUAL
005620  104001                        ERROR   1               ;***************TEST 20 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
005622                          64$:
005622  005700                        TST     R0              ;CHECK R0=0
005624  001401                        BEQ     65$
005626  104002                        ERROR   2               ;***************TEST 20 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
005630  005701                  65$:  TST     R1              ;CHECK R1=0
005632  001401                        BEQ     66$
005634  104003                        ERROR   3               ;***************TEST 20 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
005636  005702                  66$:  TST     R2              ;CHECK R2=0
005640  001401                        BEQ     67$
005642  104004                        ERROR   4               ;***************TEST 20 - ERROR 4***************
                                                            ;R2 SHOULD BE ZERO
005644  005703                  67$:  TST     R3              ;CHECK R3=0
005646  001401                        BEQ     68$
005650  104005                        ERROR   5               ;***************TEST 20 - ERROR 5***************
                                                            ;R3 SHOULD BE ZERO
005652  020467  172776          68$:  CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
005656  001401                        BEQ     69$
005660  104006                        ERROR   6               ;***************TEST 20 - ERROR 6***************
                                                            ;R4 SHOULD STILL BE DESTINATION LENGTH
005662  020567  172770          69$:  CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
005666  001401                        BEQ     70$
005670  104007                        ERROR   7               ;***************TEST 20 - ERROR 7***************
                                                            ;R5 SHOULD STILL BE DESTINATION ADDRESS
005672  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
005676  001403                        BEQ     71$             ;BR IF OK
005700  010637  000704                MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
2101  005704  104010                        ERROR   10              ;****************TEST 20 - ERROR 10***************
2102                                                                ;STACK POINTER NOT RESTORED BY INSTRUCTION
2103                                                                ;EXPECTED SP IS STORED AT "SAVR6"
2104                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
2105  005706                        71$.                            ;CHECK ANSWER
2106
2107  005706  012700  005744                MOV     #ANS20,R0       ;POINT R0 TO EXPECTED ANSWER
2108  005712  016701  172740                MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
2109  005716  016702  172732                MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
2110  005722  122021                72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
2111  005724  001401                        BEQ     73$             ;BR IF EQUAL
2112  005726  104011                        ERROR   11              ;****************TEST 20 - ERROR 11***************
2113                                                                ;ERRONEOUS ANSWER
2114                                                                ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2115                                                                ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2116  005730  005302                73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
2117  005732  001373                        BNE     72$             ;BR IF NOT FINISHED
2118  005734  000404                        BR      TST21           ;BR TO NEXT TEST
2119  005736                        S1T20:                          ;SOURCE1 STRING
2120  005736      070                       .BYTE   70              ;MOST SIGNIFICANT DIGIT
2121  005737      062                       .BYTE   62
2122  005740      064                       .BYTE   64
2123  005741                        S2T20:                          ;SOURCE2 STRING
2124  005741      061                       .BYTE   61              ;MOST SIGNIFICANT DIGIT
2125  005742      070                       .BYTE   70
2126  005743      065                       .BYTE   65
2127  005744                        ANS20:                          ;EXPECTED ANSWER
2128  005744      060                       .BYTE   60              ;MOST SIGNIFICANT DIGIT
2129  005745      071                       .BYTE   71
2130
2131                                        .EVEN
```

```
2132
2133
2134                                    ;;*****************************************************************
2135                                    ;*TEST 21       TEST INTERRUPTABILITY OF "ADDN"
2136                                    ;;*****************************************************************
2137  005746  000004                    TST21:  SCOPE
2138  005750  105777  172564                    TSTB    @SWR            ;TEST BIT 7 OF SWR
2139  005754  100555                            BMI     TST22           ;SKIP TO NEXT TEST IF SET
2140  005756  026767  172566  172700          CMP     $TPS,TCSR       ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
2141  005764  001007                            BNE     T21CONT         ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
2142  005766  032767  000001  172612          BIT     #BIT0,$ENV      ;IF YES, IS PROGRAM UNDER APT?
2143  005774  001403                            BEQ     T21CONT         ;BR, IF NOT
2144  005776  005767  172572                    TST     $PASS           ;IF YES,CHECK IF NOT ON FIRST PASS
2145  006002  001142                            BNE     TST22           ;IF NOT, BR & SKIP TEST
2146  006004                          T21CONT:
2147  006004  004567  006722                    JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
2148  006010  000004                            4                       ;SOURCE1 LENGTH
2149  006012  006260                            S1T21                   ;SOURCE1 ADDRESS
2150  006014  000004                            4                       ;SOURCE2 LENGTH
2151  006016  006264                            S2T21                   ;SOURCE2 ADDRESS
2152  006020  000005                            5                       ;DESTINATION LENGTH
2153  006022  004767  006776                    JSR     PC,CLBUF        ;CLEAR BUFFER AREA
2154  006026  012767  006106  172640          MOV     #ADDNPC,PCI     ;STORE PC OF TEST INSTRUCTION
2155  006034  012777  015114  172626          MOV     #INTR,@TVECT    ;POINT TTY VECTOR TO INTERRUPT ROUTINE
2156  006042  005077  172624                    CLR     @TPSW           ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
2157  006046  004767  007016                    JSR     PC,TDONE        ;WAIT FOR SLU READY
2158  006052  013777  000554  172606          MOV     @#$NULL,@TBUF   ;SEND NULL CHARACTER
2159  006060  004567  006760                    JSR     R5,XPSW         ;STORE EXPECTED PSW
2160  006064  000000                            .WORD   0
2161  006066  106427  000000                    MTPS    #0              ;ALLOW INTERRUPTS
2162  006072  052777  000100  172564          BIS     #100,@TCSR      ;ENABLE TTY INTERRUPTS
2163  006100  004767  006654          READDN: JSR     PC,GENR         ;SET UP GENERAL REGISTERS
2164  006104  000277                            SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
2165  006106  076050                  ADDNPC: ADDN
2166
2167  006110  106767  172562                    MFPS    CCODES          ;STORE RESULTANT PSW
2168  006114  032777  000100  172542          BIT     #100,@TCSR      ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
2169  006122  001366                            BNE     READDN          ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
2170  006124  042767  177400  172544          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
2171  006132  023767  000700  172536          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
2172  006140  001401                            BEQ     64$             ;BR, IF EQUAL
2173  006142  104001                            ERROR   1               ;***************TEST 21 - ERROR 1***************
2174                                                                    ;PSW ERROR
2175                                                                    ;EXPECTED PSW IS STORED AT "SAVR6"
2176                                                                    ;ERRONEOUS SP VALUE IS AT "BADR6"
2177  006144                          64$:
2178  006144  005700                            TST     R0              ;CHECK R0=0
2179  006146  001401                            BEQ     65$
2180  006150  104002                            ERROR   2               ;***************TEST 21 - ERROR 2***************
2181                                                                    ;R0 SHOULD BE ZERO
2182  006152  005701                  65$:      TST     R1              ;CHECK R1=0
2183  006154  001401                            BEQ     66$
2184  006156  104003                            ERROR   3               ;***************TEST 21 - ERROR 3***************
2185                                                                    ;R1 SHOULD BE ZERO
2186  006160  005702                  66$:      TST     R2              ;CHECK R2=0
2187  006162  001401                            BEQ     67$
```

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006164  104004                              ERROR   4               ;***************TEST 21 - ERROR 4***************
                                                                    ;R2 SHOULD BE ZERO
006166  005703                      67$:    TST     R3              ;CHECK R3=0
006170  001401                              BEQ     68$
006172  104005                              ERROR   5               ;***************TEST 21 - ERROR 5***************
                                                                    ;R3 SHOULD BE ZERO
006174  020467  172454              68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
006200  001401                              BEQ     69$
006202  104006                              ERROR   6               ;***************TEST 21 - ERROR 6***************
                                                                    ;R4 SHOULD STILL BE DESTINATION LENGTH
006204  020567  172446              69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
006210  001401                              BEQ     70$
006212  104007                              ERROR   7               ;***************TEST 21 - ERROR 7***************
                                                                    ;R5 SHOULD STILL BE DESTINATION ADDRESS
006214  023706  000702              70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
006220  001403                              BEQ     71$             ;BR IF OK
006222  010637  000704                      MOV     SP,@#BADR6      ;COPY BAD SP VALUE
006226  104010                              ERROR   10              ;***************TEST 21 - ERROR 10***************
                                                                    ;STACK POINTER NOT RESTORED BY INSTRUCTION
                                                                    ;EXPECTED SP IS STORED AT "SAVR6"
                                                                    ;ERRONEOUS SP VALUE IS AT "BADR6"
006230                              71$:
                                                                    ;CHECK ANSWER
006230  012700  006270                      MOV     #ANS21,R0       ;POINT R0 TO EXPECTED ANSWER
006234  016701  172416                      MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
006240  016702  172410                      MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
006244  122021                      72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
006246  001401                              BEQ     73$             ;BR IF EQUAL
006250  104011                              ERROR   11              ;***************TEST 21 - ERROR 11***************
                                                                    ;ERRONEOUS ANSWER
                                                                    ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
                                                                    ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
006252  005302                      73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
006254  001373                              BNE     72$             ;BR IF NOT FINISHED
006256  000407                              BR      ENDT21          ;BR TO END OF THIS TEST
006260                              S1T21:                          ;SOURCE1 STRING
006260     061                              .BYTE   61              ;MOST SIGNIFICANT DIGIT
006261     062                              .BYTE   62
006262     063                              .BYTE   63
006263     064                              .BYTE   64
006264                              S2T21:                          ;SOURCE2 STRING
006264     065                              .BYTE   65              ;MOST SIGNIFICANT DIGIT
006265     066                              .BYTE   66
006266     067                              .BYTE   67
006267     070                              .BYTE   70
006270                              ANS21:                          ;EXPECTED ANSWER
006270     060                              .BYTE   60              ;MOST SIGNIFICANT DIGIT
006271     066                              .BYTE   66
006272     071                              .BYTE   71
006273     061                              .BYTE   61
006274     062                              .BYTE   62

        006276                              .EVEN
006276  016777  172370  172364      ENDT21: MOV     TPSW,@TVECT
006304  106427  000200                      MTPS    #200
```

```
                                ;;*****************************************************************
                                ;*TEST 22       TEST "SUBN" WITH POSITIVE OPERANDS,SRC1 .GT. SRC2
                                ;;*****************************************************************
006310  000004                  TST22:  SCOPE
006312  004567  006414                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
006316  000004                          4                       ;SOURCE1 LENGTH
006320  006514                          S1T22                   ;SOURCE1 ADDRESS
006322  000003                          3                       ;SOURCE2 LENGTH
006324  006520                          S2T22                   ;SOURCE2 ADDRESS
006326  000003                          3                       ;DESTINATION LENGTH
006330  004767  006470                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
006334  004567  006504                  JSR     R5,XPSW
006340  000210                          .WORD   210
006342  004767  006412                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
006346  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
006350  000250                          CLN
006352  076051                          SUBN
006354  106767  172316                  MFPS    CCODES          ;STORE RESULTANT PSW
006360  042767  177400  172310          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
006366  023767  000700  172302          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
006374  001401                          BEQ     64$             ;BR, IF EQUAL
006376  104001                          ERROR   1               ;***************TEST 22 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR5"
                                                                ;ERRONEOUS SP VALJE IS AT "BADR6"
006400                          64$:
006400  005700                          TST     R0              ;CHECK R0=0
006402  001401                          BEQ     65$
006404  104002                          ERROR   2               ;***************TEST 22 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
006406  005701                  65$:    TST     R1              ;CHECK R1=0
006410  001401                          BEQ     66$
006412  104003                          ERROR   3               ;***************TEST 22 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
006414  005702                  66$:    TST     R2              ;CHECK R2=0
006416  001401                          BEQ     67$
006420  104004                          ERROR   4               ;***************TEST 22 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
006422  005703                  67$:    TST     R3              ;CHECK R3=0
006424  001401                          BEQ     68$
006426  104005                          ERROR   5               ;***************TEST 22 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
006430  020467  172220          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
006434  001401                          BEQ     69$
006436  104006                          ERROR   6               ;***************TEST 22 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
006440  020567  172212          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
006444  001401                          BEQ     70$
006446  104007                          ERROR   7               ;***************TEST 22 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
006450  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
006454  001403                          BEQ     71$             ;BR IF OK
006456  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
```

```
                        T22     TEST "SUBN" WITH POSITIVE OPERANDS,SRC1 .GT. SRC2                       SEQ 0058

2299  006462  104010                ERROR   10              ;****************TEST 22 - ERROR 10***************
2300                                                        ;STACK POINTER NOT RESTORED BY INSTRUCTION
2301                                                        ;EXPECTED SP IS STORED AT "SAVR6"
2302                                                        ;ERRONEOUS SP VALUE IS AT "BADR6"
2303  006464                    71$:
2304                                                        ;CHECK ANSWER
2305  006464  012700  006523           MOV     #ANS22,R0    ;POINT R0 TO EXPECTED ANSWER
2306  006470  016701  172162           MOV     DSTAD,R1     ;POINT R1 TO RESULTANT ANSWER
2307  006474  016702  172154           MOV     DSTLN,R2     ;STORE ANSWER LENGTH IN R1
2308  006500  122021            72$:    CMPB    (R0)+,(R1)+  ;COMPARE EACH DIGIT
2309  006502  001401                   BEQ     73$          ;BR IF EQUAL
2310  006504  104011                   ERROR   11           ;****************TEST 22 - ERROR 11***************
2311                                                        ;ERRONEOUS ANSWER
2312                                                        ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2313                                                        ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2314  006506  005302            73$:    DEC     R2           ;DECREMENT ANSWER LENGTH
2315  006510  001373                   BNE     72$          ;BR IF NOT FINISHED
2316  006512  000405                   BR      TST23        ;BR TO NEXT TEST
2317  006514                    S1T22:                      ;SOURCE1 STRING
2318  006514      060                  .BYTE   60           ;MOST SIGNIFICANT DIGIT
2319  006515      071                  .BYTE   71
2320  006516      066                  .BYTE   66
2321  006517      062                  .BYTE   62
2322  006520                    S2T22:                      ;SOURCE2 STRING
2323  006520      067                  .BYTE   67           ;MOST SIGNIFICANT DIGIT
2324  006521      065                  .BYTE   65
2325  006522      064                  .BYTE   64
2326  006523                    ANS22:                      ;EXPECTED ANSWER
2327  006523      062                  .BYTE   62           ;MOST SIGNIFICANT DIGIT
2328  006524      060                  .BYTE   60
2329  006525      170                  .BYTE   170
2330
2331                                   .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 23       TEST "SUBN" WITH NEGATIVE OPERANDS, SRC1 .GTT. SRC2
                                        ;;*****************************************************************
006526  000004                  TST23:  SCOPE
006530  004567  006176                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
006534  000003                          3                       ;SOURCE1 LENGTH
006536  006730                          S1T23                   ;SOURCE1 ADDRESS
006540  000004                          4                       ;SOURCE2 LENGTH
006542  006733                          S2T23                   ;SOURCE2 ADDRESS
006544  000003                          3                       ;DESTINATION LENGTH
006546  004767  006252                  JSR     PC,CLBUF        ;CLEAR BUFFER AREA
006552  004567  006266                  JSR     R5,XPSW
006556  000200                          .WORD   200
006560  004767  006174                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
006564  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
006566  076051                          SUBN
006570  106767  172102                  MFPS    CCODES          ;STORE RESULTANT PSW
006574  042767  177400  172074          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
006602  023767  000700  172066          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
006610  001401                          BEQ     64$             ;BR, IF EQUAL
006612  104001                          ERROR   1               ;***************TEST 23 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
006614                          64$:
006614  005700                          TST     R0              ;CHECK R0=0
006616  001401                          BEQ     65$
006620  104002                          ERROR   2               ;***************TEST 23 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
006622  005701                  65$:    TST     R1              ;CHECK R1=0
006624  001401                          BEQ     66$
006626  104003                          ERROR   3               ;***************TEST 23 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
006630  005702                  66$:    TST     R2              ;CHECK R2=0
006632  001401                          BEQ     67$
006634  104004                          ERROR   4               ;***************TEST 23 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
006636  005703                  67$:    TST     R3              ;CHECK R3=0
006640  001401                          BEQ     68$
006642  104005                          ERROR   5               ;***************TEST 23 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
006644  020467  172004          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
006650  001401                          BEQ     69$
006652  104006                          ERROR   6               ;***************TEST 23 - ERROR 6***************
                                                                ;R4 SHOULD STILL BE DESTINATION LENGTH
006654  020567  171776          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
006660  001401                          BEQ     70$
006662  104007                          ERROR   7               ;***************TEST 23 - ERROR 7***************
                                                                ;R5 SHOULD STILL BE DESTINATION ADDRESS
006664  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
006670  001403                          BEQ     71$             ;BR IF OK
006672  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
006676  104010                          ERROR   10              ;***************TEST 23 - ERROR 10**************
                                                                ;STACK POINTER NOT RESTORED BY INSTRUCTION
```

G05


```
                                                                 ;EXPECTED SP IS STORED AT "SAVR6"
                                                                 ;ERRONEOUS SP VALUE IS AT "BADR6"
006700                          71$:
                                                                 ;CHECK ANSWER
006700  012700  006737                  MOV     #ANS23,R0        ;POINT R0 TO EXPECTED ANSWER
006704  016701  171746                  MOV     DSTAD,R1         ;POINT R1 TO RESULTANT ANSWER
006710  016702  171740                  MOV     DSTLN,R2         ;STORE ANSWER LENGTH IN R1
006714  122021                  72$:    CMPB    (R0)+,(R1)+      ;COMPARE EACH DIGIT
006716  001401                          BEQ     73$              ;BR IF EQUAL
006720  104011                          ERROR   11               ;***************TEST 23 - ERROR 11***************
                                                                 ;ERRONEOUS ANSWER
                                                                 ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
                                                                 ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
006722  005302                  73$:    DEC     R2               ;DECREMENT ANSWER LENGTH
006724  001373                          BNE     72$              ;BR IF NOT FINISHED
006726  000405                          BR      TST24            ;BR TO NEXT TEST
006730                          S1T23:                           ;SOURCE1 STRING
006730     071                          .BYTE   71               ;MOST SIGNIFICANT DIGIT
006731     066                          .BYTE   66
006732     162                          .BYTE   162
006733                          S2T23:                           ;SOURCE2 STRING
006733     060                          .BYTE   60               ;MOST SIGNIFICANT DIGIT
006734     070                          .BYTE   70
006735     063                          .BYTE   63
006736     161                          .BYTE   161
006737                          ANS23:                           ;EXPECTED ANSWER
006737     061                          .BYTE   61               ;MOST SIGNIFICANT DIGIT
006740     063                          .BYTE   63
006741     061                          .BYTE   61

                                        .EVEN
```

```
2419
2420                                    ;;*****************************************************************
2421                                    ;*TEST 24       TEST INTERRUPTABILITY OF "SUBN"
2422                                    ;;*****************************************************************
2423  006742  000004                    TST24:  SCOPE
2424  006744  105777  171570                    TSTB    @SWR            ;TEST BIT 7 OF SWR
2425  006750  100556                            BMI     TST25           ;SKIP TO NEXT TEST IF SET
2426  006752  026767  171572  171704          CMP     $TPS,TCSR       ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
2427  006760  001007                            BNE     T24CONT         ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
2428  006762  032767  000001  171616          BIT     #BIT0,$ENV      ;IF YES, IS PROGRAM UNDER APT?
2429  006770  001403                            BEQ     T24CONT         ;BR, IF NOT
2430  006772  005767  171576                    TST     $PASS           ;IF YES,CHECK IF NOT ON FIRST PASS
2431  006776  001143                            BNE     TST25           ;IF NOT, BR & SKIP TEST
2432  007000                          T24CONT:
2433  007000  004567  005726                    JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
2434  007004  000004                            4                       ;SOURCE1 LENGTH
2435  007006  007256                            S1T24                   ;SOURCE1 ADDRESS
2436  007010  000004                            4                       ;SOURCE2 LENGTH
2437  007012  007262                            S2T24                   ;SOURCE2 ADDRESS
2438  007014  000005                            5                       ;DESTINATION LENGTH
2439  007016  004767  006002                    JSR     PC,CLBUF        ;CLEAR BUFFER AREA
2440  007022  012767  007104  171644          MOV     #SUBNPC,PCI     ;STORE PC OF TEST INSTRUCTION
2441  007030  012777  015114  171632          MOV     #INTR,@TVECT    ;POINT TTY VECTOR TO INTERRUPT ROUTINE
2442  007036  005077  171630                    CLR     @TPSW           ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
2443  007042  004767  006022                    JSR     PC,TDONE        ;WAIT FOR SLU READY
2444  007046  013777  000554  171612          MOV     @#$NULL,@TBUF   ;SEND NULL CHARACTER
2445  007054  004567  005764                    JSR     R5,XPSW         ;STORE EXPECTED PSW
2446  007060  000010                            .WORD   10
2447  007062  106427  000000                    MTPS    #0              ;ALLOW INTERRUPTS
2448  007066  052777  000100  171570          BIS     #100,@TCSR      ;ENABLE TTY INTERRUPTS
2449  007074  004767  005660          RESUBN: JSR     PC,GENR         ;SET UP GENERAL REGISTERS
2450  007100  000277                            SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
2451  007102  000250                            CLN
2452  007104  076051                  SUBNPC: SUBN
2453
2454  007106  106767  171564                    MFPS    CCODES          ;STORE RESULTANT PSW
2455  007112  032777  000100  171544          BIT     #100,@TCSR      ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
2456  007120  001365                            BNE     RESUBN          ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
2457  007122  042767  177400  171546          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
2458  007130  023767  000700  171540          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
2459  007136  001401                            BEQ     64$             ;BR, IF EQUAL
2460  007140  104001                            ERROR   1               ;****************TEST 24 - ERROR 1***************
2461                                            ;PSW ERROR
2462                                            ;EXPECTED PSW IS STORED AT "SAVR6"
2463                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
2464  007142                          64$:
2465  007142  005700                            TST     R0              ;CHECK R0=0
2466  007144  001401                            BEQ     65$
2467  007146  104002                            ERROR   2               ;****************TEST 24 - ERROR 2***************
2468                                            ;R0 SHOULD BE ZERO
2469  007150  005701                  65$:      TST     R1              ;CHECK R1=0
2470  007152  001401                            BEQ     66$
2471  007154  104003                            ERROR   3               ;****************TEST 24 - ERROR 3***************
2472                                            ;R1 SHOULD BE ZERO
2473  007156  005702                  66$:      TST     R2              ;CHECK R2=0
2474  007160  001401                            BEQ     67$
```

```
2475  007162  104004                          ERROR   4               ;***************TEST 24 - ERROR 4***************
2476                                                                  ;R2 SHOULD BE ZERO
2477  007164  005703                  67$:     TST     R3              ;CHECK R3=0
2478  007166  001401                          BEQ     68$
2479  007170  104005                          ERROR   5               ;***************TEST 24 - ERROR 5***************
2480                                                                  ;R3 SHOULD BE ZERO
2481  007172  020467  171456          68$:    CMP     R4,DSTLN        ;CHECK R4= DESTINATION LENGTH
2482  007176  001401                          BEQ     69$
2483  007200  104006                          ERROR   6               ;***************TEST 24 - ERROR 6***************
2484                                                                  ;R4 SHOULD STILL BE DESTINATION LENGTH
2485  007202  020567  171450          69$:    CMP     R5,DSTAD        ;CHECK R5 = DESTINATION ADDRESS
2486  007206  001401                          BEQ     70$
2487  007210  104007                          ERROR   7               ;***************TEST 24 - ERROR 7***************
2488                                                                  ;R5 SHOULD STILL BE DESTINATION ADDRESS
2489  007212  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
2490  007216  001403                          BEQ     71$             ;BR IF OK
2491  007220  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
2492  007224  104010                          ERROR   10              ;***************TEST 24 - ERROR 10**************
2493                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
2494                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
2495                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
2496  007226                          71$:
2497                                                                  ;CHECK ANSWER
2498  007226  012700  007266                  MOV     #ANS24,R0       ;POINT R0 TO EXPECTED ANSWER
2499  007232  016701  171420                  MOV     DSTAD,R1        ;POINT R1 TO RESULTANT ANSWER
2500  007236  016702  171412                  MOV     DSTLN,R2        ;STORE ANSWER LENGTH IN R1
2501  007242  122021                  72$:    CMPB    (R0)+,(R1)+     ;COMPARE EACH DIGIT
2502  007244  001401                          BEQ     73$             ;BR IF EQUAL
2503  007246  104011                          ERROR   11              ;***************TEST 24 - ERROR 11**************
2504                                                                  ;ERRONEOUS ANSWER
2505                                                                  ;R0 CONTAINS THE PC+1 OF THE EXPECTED DIGIT
2506                                                                  ;R1 CONTAINS THE PC+1 OF THE RESULTANT DIGIT
2507  007250  005302                  73$:    DEC     R2              ;DECREMENT ANSWER LENGTH
2508  007252  001373                          BNE     72$             ;BR IF NOT FINISHED
2509  007254  000407                          BR      ENDT24          ;BR TO END OF THIS TEST
2510  007256                          S1T24:                          ;SOURCE1 STRING
2511  007256     061                          .BYTE   61              ;MOST SIGNIFICANT DIGIT
2512  007257     062                          .BYTE   62
2513  007260     063                          .BYTE   63
2514  007261     064                          .BYTE   64
2515  007262                          S2T24:                          ;SOURCE2 STRING
2516  007262     065                          .BYTE   65              ;MOST SIGNIFICANT DIGIT
2517  007263     066                          .BYTE   66
2518  007264     067                          .BYTE   67
2519  007265     170                          .BYTE   170
2520  007266                          ANS24:                          ;EXPECTED ANSWER
2521  007266     060                          .BYTE   60              ;MOST SIGNIFICANT DIGIT
2522  007267     066                          .BYTE   66
2523  007270     071                          .BYTE   71
2524  007271     061                          .BYTE   61
2525  007272     162                          .BYTE   162
2526
2527          007274                          .EVEN
2528  007274  016777  171372  171366  ENDT24: MOV     TPSW,@TVECT
2529  007302  106427  000200                  MTPS    #200
```

```
                                        ;;*****************************************************************
                                        ;*TEST 25       TEST "CMPN" WITH ALL ZEROES IN BOTH SOURCE STRINGS
                                        ;;*****************************************************************
007306  000004                  TST25:  SCOPE
007310  004567  005416                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
007314  000003                          3                       ;SOURCE1 LENGTH
007316  007460                          S1T25   ;SOURCE1 ADDRESS
007320  000003                          3                       ;SOURCE2 LENGTH
007322  007463                          S2T25                   ;SOURCE2 ADDRESS
007324  000377                          377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
007326  004567  005512                  JSR     R5,XPSW
007332  000204                          .WORD   204
007334  004767  005420                  JSR     PC,GENP         ;SET UP GENERAL REGISTERS
007340  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
007342  000244                          CLZ

007344  076052                          CMPN

007346  106767  171324                  MFPS    CCODES          ;STORE RESULTANT PSW
007352  042767  177400  171316          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
007360  023767  000700  171310          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
007366  001401                          BEQ     64$             ;BR, IF EQUAL
007370  104001                          ERROR   1               ;***************TEST 25 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
007372                          64$:
007372  005700                          TST     R0              ;CHECK R0=0
007374  001401                          BEQ     65$
007376  104002                          ERROR   2               ;***************TEST 25 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
007400  005701                  65$:    TST     R1              ;CHECK R1=0
007402  001401                          BEQ     66$
007404  104003                          ERROR   3               ;***************TEST 25 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
007406  005702                  66$:    TST     R2              ;CHECK R2=0
007410  001401                          BEQ     67$
007412  104004                          ERROR   4               ;***************TEST 25 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
007414  005703                  67$:    TST     R3              ;CHECK R3=0
007416  001401                          BEQ     68$
007420  104005                          ERROR   5               ;***************TEST 25 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
007422  020467  171226          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
007426  001401                          BEQ     69$             ;BR IF OK
007430  104006                          ERROR   6               ;***************TEST 25 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
007432  020567  171220          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
007436  001401                          BEQ     70$
007440  104007                          ERROR   7               ;***************TEST 25 - ERROR 7***************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
007442  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

T25 TEST "CMPN" WITH ALL ZEROES IN BOTH SOURCE STRINGS SEQ 0064

```
2586  007446  001403                    BEQ     71$             ;BR IF OK
2587  007450  010637  000734            MOV     SP,@#BADR6      ;COPY BAD SP VALUE
2588  007454  104010                    ERROR   10              ;****************TEST 25 - ERROR 10***************
2589                                                            ;STACK POINTER NOT RESTORED BY INSTRUCTION
2590                                                            ;EXPECTED SP IS STORED AT "SAVR6"
2591                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
2592  007456                    71$:
2593  007456  000403                    BR      TST26           ;BR TO NEXT TEST
2594  007460                    S1T25:                          ;SOURCE1 STRING
2595  007460     060                    .BYTE   60              ;MOST SIGNIFICANT DIGIT
2596  007461     060                    .BYTE   60
2597  007462     060                    .BYTE   60
2598  007463                    S2T25:                          ;SOURCE2 STRING
2599  007463     060                    .BYTE   60              ;MOST SIGNIFICANT DIGIT
2600  007464     060                    .BYTE   60
2601  007465     060                    .BYTE   60
2602
2603                                    .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 26        TEST "CMPN" WITH SRC1 = SRC2
                                        ;;*****************************************************************
007466  000004                  TST26:  SCOPE
007470  004567  005236                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
007474  000004                          4                       ;SOURCE1 LENGTH
007476  007640                          S1T26   ;SOURCE1 ADDRESS
007500  000004                          4                       ;SOURCE2 LENGTH
007502  007644                          S2T26                   ;SOURCE2 ADDRESS
007504  000377                          377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
007506  004567  005332                  JSR     R5,XPSW
007512  000204                          .WORD   204
007514  004767  005240                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
007520  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
007522  000244                          CLZ

007524  076052                          CMPN

007526  106767  171144                  MFPS    CCODES          ;STORE RESULTANT PSW
007532  042767  177400  171136          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
007540  023767  000700  171130          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
007546  001401                          BEQ     64$             ;BR, IF EQUAL
007550  104001                          ERROR   1               ;***************TEST 26 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
007552                          64$:
007552  005700                          TST     R0              ;CHECK R0=0
007554  001401                          BEQ     65$
007556  104002                          ERROR   2               ;***************TEST 26 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
007560  005701                  65$:    TST     R1              ;CHECK R1=0
007562  001401                          BEQ     66$
007564  104003                          ERROR   3               ;***************TEST 26 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
007566  005702                  66$:    TST     R2              ;CHECK R2=0
007570  001401                          BEQ     67$
007572  104004                          ERROR   4               ;***************TEST 26 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
007574  005703                  67$:    TST     R3              ;CHECK R3=0
007576  001401                          BEQ     68$
007600  104005                          ERROR   5               ;***************TEST 26 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
007602  020467  171046          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
007606  001401                          BEQ     69$             ;BR IF OK
007610  104006                          ERROR   6               ;***************TEST 26 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
007612  020567  171040          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
007616  001401                          BEQ     70$
007620  104007                          ERROR   7               ;***************TEST 26 - ERROR 7***************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
007622  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

T26 TEST "CMPN" WITH SRC1 = SRC2 SEQ 0066

```
2660  007626  001403                BEQ     71$             ;BR IF OK
2661  007630  010637  000704        MOV     SP,@#BADR6      ;COPY BAD SP VALUE
2662  007634  104010                ERROR   10              ;****************TEST 26 - ERROR 10***************
2663                                                        ;STACK POINTER NOT RESTORED BY INSTRUCTION
2664                                                        ;EXPECTED SP IS STORED AT "SAVR6"
2665                                                        ;ERRONEOUS SP VALUE IS AT "BADR6"
2666  007636                    71$:
2667  007636  000404                BR      TST27           ;BR TO NEXT TEST
2668  007640                    S1T26:                      ;SOURCE1 STRING
2669  007640     071                    .BYTE   71          ;MOST SIGNIFICANT DIGIT
2670  007641     066                    .BYTE   66
2671  007642     062                    .BYTE   62
2672  007643     063                    .BYTE   63
2673  007644                    S2T26:                      ;SOURCE2 STRING
2674  007644     071                    .BYTE   71          ;MOST SIGNIFICANT DIGIT
2675  007645     066                    .BYTE   66
2676  007646     062                    .BYTE   62
2677  007647     063                    .BYTE   63
2678
2679                                    .EVEN
```

```
                                ;;*****************************************************************
                                ;*TEST 27       TEST "CMPN" WITH IDENTICAL NON-ZERO MAGNITUDES, NEGATIVE SOURCE2, POSITI
                                ;;*****************************************************************
007650  000004                TST27:  SCOPE
007652  004567  005054                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
007656  000004                        4                       ;SOURCE1 LENGTH
007660  010020                        S1T27   ;SOURCE1 ADDRESS
007662  000004                        4                       ;SOURCE2 LENGTH
007664  010024                        S2T27                   ;SOURCE2 ADDRESS
007666  000377                        377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
007670  004567  005150                JSR     R5,XPSW
007674  000200                        .WORD   200
007676  004767  005056                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
007702  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S

007704  076052                        CMPN

007706  106767  170764                MFPS    CCODES          ;STORE RESULTANT PSW
007712  042767  177400  170756        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
007720  023767  000700  170750        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
007726  001401                        BEQ     64$             ;BR, IF EQUAL
007730  104001                        ERROR   1               ;***************TEST 27 - ERROR 1***************
                                                              ;PSW ERROR
                                                              ;EXPECTED PSW IS STORED AT "SAVR6"
                                                              ;ERRONEOUS SP VALUE IS AT "BADR6"
007732                          64$:
007732  005700                        TST     R0              ;CHECK R0=0
007734  001401                        BEQ     65$
007736  104002                        ERROR   2               ;***************TEST 27 - ERROR 2***************
                                                              ;R0 SHOULD BE ZERO
007740  005701                  65$:  TST     R1              ;CHECK R1=0
007742  001401                        BEQ     66$
007744  104003                        ERROR   3               ;***************TEST 27 - ERROR 3***************
                                                              ;R1 SHOULD BE ZERO
007746  005702                  66$:  TST     R2              ;CHECK R2=0
007750  001401                        BEQ     67$
007752  104004                        ERROR   4               ;***************TEST 27 - ERROR 4***************
                                                              ;R2 SHOULD BE ZERO
007754  005703                  67$:  TST     R3              ;CHECK R3=0
007756  001401                        BEQ     68$
007760  104005                        ERROR   5               ;***************TEST 27 - ERROR 5***************
                                                              ;R3 SHOULD BE ZERO
007762  020467  170666          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
007766  001401                        BEQ     69$             ;BR IF OK
007770  104006                        ERROR   6               ;***************TEST 27 - ERROR 6***************
                                                              ;R4 CHANGED
                                                              ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
007772  020567  170660          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
007776  001401                        BEQ     70$
010000  104007                        ERROR   7               ;***************TEST 27 - ERROR 7***************
                                                              ;R5 CHANGED
                                                              ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
010002  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
010006  001403                        BEQ     71$             ;BR IF OK
```

```
2736  010010  010637  000704                 MOV     SP,@#BADR6      ;COPY BAD SP VALUE
2737  010014  104010                         ERROR   10              ;****************TEST 27 - ERROR 10***************
2738                                                                 ;STACK POINTER NOT RESTORED BY INSTRJCTION
2739                                                                 ;EXPECTED SP IS STORED AT "SAVR6"
2740                                                                 ;ERRONEOUS SP VALUE IS AT "BADR6"
2741  010016                          71$:
2742  010016  000404                         BR      TST30           ;BR TO NEXT TEST
2743  010020                          S1T27:                          ;SOURCE1 STRING
2744  010020     071                          .BYTE   71              ;MOST SIGNIFICANT DIGIT
2745  010021     067                          .BYTE   67
2746  010022     065                          .BYTE   65
2747  010023     063                          .BYTE   63
2748  010024                          S2T27:                          ;SOURCE2 STRING
2749  010024     071                          .BYTE   71              ;MOST SIGNIFICANT DIGIT
2750  010025     067                          .BYTE   67
2751  010026     065                          .BYTE   65
2752  010027     163                          .BYTE   163
2753
2754                                          .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 30       TEST "CMPN" WITH IDENTICAL NON-ZERO MAGNITUDES, POSITIVE SOURCE2, NEGATI
                                        ;;*****************************************************************
010030  000004                 T30:    SCOPE
010032  004567  004674                 JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
010036  000004                         4                       ;SOURCE1 LENGTH
010040  010202                         S1T30   ;SOURCE1 ADDRESS
010042  000004                         4                       ;SOURCE2 LENGTH
010044  010206                         S2T30                   ;SOURCE2 ADDRESS
010046  000377                         377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
010050  004567  004770                 JSR     R5,XPSW
010054  000210                         .WORD   210
010056  004767  004676                 JSR     PC,GENR         ;SET UP GENERAL REGISTERS
010062  000277                         SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
010064  000250                         CLN

010066  076052                         CMPN

010070  106767  170602                 MFPS    CCODES          ;STORE RESULTANT PSW
010074  042767  177400  170574         BIC     #177400,CCODES  ;CLEAR UNUSED BITS
010102  023767  000700  170566         CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
010110  001401                         BEQ     64$             ;BR, IF EQUAL
010112  104001                         ERROR   1               ;***************TEST 30 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
010114                          64$:
010114  005700                         TST     R0              ;CHECK R0=0
010116  001401                         BEQ     65$
010120  104002                         ERROR   2               ;***************TEST 30 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
010122  005701                 65$:    TST     R1              ;CHECK R1=0
010124  001401                         BEQ     66$
010126  104003                         ERROR   3               ;***************TEST 30 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
010130  005702                 66$:    TST     R2              ;CHECK R2=0
010132  001401                         BEQ     67$
010134  104004                         ERROR   4               ;***************TEST 30 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
010136  005703                 67$:    TST     R3              ;CHECK R3=0
010140  001401                         BEQ     68$
010142  104005                         ERROR   5               ;***************TEST 30 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
010144  020467  170504         68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
010150  001401                         BEQ     69$             ;BR IF OK
010152  104006                         ERROR   6               ;***************TEST 30 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
010154  020567  170476         69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
010160  001401                         BEQ     70$
010162  104007                         ERROR   7               ;***************TEST 30 - ERROR 7***************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
010164  023706  000702         70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

```
2811  010170  001403                        BEQ     71$             ;BR IF OK
2812  010172  010637  000704                MOV     SP,@#BADR6      ;COPY BAD SP VALUE
2813  010176  104010                        ERROR   10              ;****************TEST 30 - ERROR 10***************
2814                                                                 ;STACK POINTER NOT RESTORED BY INSTRUCTION
2815                                                                 ;EXPECTED SP IS STORED AT "SAVR6"
2816                                                                 ;ERRONEOUS SP VALUE IS AT "BADR6"
2817  010200                          71$:
2818  010200  000404                        BR      TST31           ;BR TO NEXT TEST
2819  010202                          S1T30:                          ;SOURCE1 STRING
2820  010202     070                         .BYTE   70              ;MOST SIGNIFICANT DIGIT
2821  010203     066                         .BYTE   66
2822  010204     064                         .BYTE   64
2823  010205     162                         .BYTE   162
2824  010206                          S2T30:                          ;SOURCE2 STRING
2825  010206     070                         .BYTE   70              ;MOST SIGNIFICANT DIGIT
2826  010207     066                         .BYTE   66
2827  010210     064                         .BYTE   64
2828  010211     062                         .BYTE   62
2829
2830                                        .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 31       TEST "CMPN" WITH +SRC1 & -SRC2, S1L = S2L, /S1/ .GT. /S2/
                                        ;;*****************************************************************
010212  000004                TST31:  SCOPE
010214  004567  004512                JSR     R5,#PREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
010220  000002                        2                       ;SOURCE1 LENGTH
010222  010364                        S1T31   ;SOURCE1 ADDRESS
010224  000002                        2                       ;SOURCE2 LENGTH
010226  010366                        S2T31                   ;SOURCE2 ADDRESS
010230  000377                        377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
010232  004567  004606                JSR     R5,XPSW
010236  000200                        .WORD   200
010240  004767  004514                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
010244  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
010246  000250                        CLN

010250  076052                        CMPN

010252  106767  170420                MFPS    CCODES          ;STORE RESULTANT PSW
010256  042767  177400  170412        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
010264  023767  000700  170404        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
010272  001401                        BEQ     64$             ;BR, IF EQUAL
010274  104001                        ERROR   1               ;***************TEST 31 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
010276                          64$:
010276  005700                        TST     R0              ;CHECK R0=0
010300  001401                        BEQ     65$
010302  104002                        ERROR   2               ;***************TEST 31 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
010304  005701                  65$:  TST     R1              ;CHECK R1=0
010306  001401                        BEQ     66$
010310  104003                        ERROR   3               ;***************TEST 31 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
010312  005702                  66$:  TST     R2              ;CHECK R2=0
010314  001401                        BEQ     67$
010316  104004                        ERROR   4               ;***************TEST 31 - ERROR 4***************
                                                            ;R2 SHOULD BE ZERO
010320  005703                  67$:  TST     R3              ;CHECK R3=0
010322  001401                        BEQ     68$
010324  104005                        ERROR   5               ;***************TEST 31 - ERROR 5***************
                                                            ;R3 SHOULD BE ZERO
010326  020467  170322          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
010332  001401                        BEQ     69$             ;BR IF OK
010334  104006                        ERROR   6               ;***************TEST 31 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
010336  020567  170314          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
010342  001401                        BEQ     70$
010344  104007                        ERROR   7               ;***************TEST 31 - ERROR 7***************
                                                            ;R5 CHANGED
                                                            ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
```

```
 2887  010346  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
 2888  010352  001403                          BEQ     71$             ;BR IF OK
 2889  010354  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
 2890  010360  104010                          ERROR   10              ;***************TEST 31 - ERROR 10***************
 2891                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
 2892                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
 2893                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
 2894  010362                          71$:
 2895  010362  000402                          BR      TST32           ;BR TO NEXT TEST
 2896  010364                          S1T31:                          ;SOURCE1 STRING
 2897  010364     071                          .BYTE   71              ;MOST SIGNIFICANT DIGIT
 2898  010365     066                          .BYTE   66
 2899  010366                          S2T31:                          ;SOURCE2 STRING
 2900  010366     066                          .BYTE   66              ;MOST SIGNIFICANT DIGIT
 2901  010367     171                          .BYTE   171
 2902
 2903                                          .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 32       TEST "CMPN" WITH -SRC1 & +SRC2, S1L = S2L, /S1/ .GT. /S2/
                                        ;;*****************************************************************
010370  000004                        TST32:  SCOPE
010372  004567  004334                        JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
010376  000003                                3                       ;SOURCE1 LENGTH
010400  010542                                S1T32   ;SOURCE1 ADDRESS
010402  000003                                3                       ;SOURCE2 LENGTH
010404  010545                                S2T32                   ;SOURCE2 ADDRESS
010406  000377                                377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
010410  004567  004430                        JSR     R5,XPSW
010414  000210                                .WORD   210
010416  004767  004336                        JSR     PC,GENP         ;SET UP GENERAL REGISTERS
010422  000267                                +SEV!SEZ!SEC                    ;SET UP THE COMPLEMENT OF EXPECTED CC'S
010424  000250                                CLN

010426  076052                                CMPN

010430  106767  170242                        MFPS    CCODES          ;STORE RESULTANT PSW
010434  042767  177400  170234                BIC     #177400,CCODES  ;CLEAR UNUSED BITS
010442  023767  000700  170226                CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
010450  001401                                BEQ     64$             ;BR, IF EQUAL
010452  104001                                ERROR   1               ;***************TEST 32 - ERROR 1***************
                                                                        ;PSW ERROR
                                                                        ;EXPECTED PSW IS STORED AT "SAVR5"
                                                                        ;ERRONEOUS SP VALUE IS AT "BADR6"
010454                                  64$:
010454  005700                                TST     R0              ;CHECK R0=0
010456  001401                                BEQ     65$
010460  104002                                ERROR   2               ;***************TEST 32 - ERROR 2***************
                                                                        ;R0 SHOULD BE ZERO
010462  005701                          65$:  TST     R1              ;CHECK R1=0
010464  001401                                BEQ     66$
010466  104003                                ERROR   3               ;***************TEST 32 - ERROR 3***************
                                                                        ;R1 SHOULD BE ZERO
010470  005702                          66$:  TST     R2              ;CHECK R2=0
010472  001401                                BEQ     67$
010474  104004                                ERROR   4               ;***************TEST 32 - ERROR 4***************
                                                                        ;R2 SHOULD BE ZERO
010476  005703                          67$:  TST     R3              ;CHECK R3=0
010500  001401                                BEQ     68$
010502  104005                                ERROR   5               ;***************TEST 32 - ERROR 5***************
                                                                        ;R3 SHOULD BE ZERO
010504  020467  170144                  68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
010510  001401                                BEQ     69$             ;BR IF OK
010512  104006                                ERROR   6               ;***************TEST 32 - ERROR 6***************
                                                                        ;R4 CHANGED
                                                                        ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
010514  020567  170136                  69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
010520  001401                                BEQ     70$
010522  104007                                ERROR   7               ;***************TEST 32 - ERROR 7***************
                                                                        ;R5 CHANGED
                                                                        ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
010524  023706  000702                  70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

T32 TEST "CMPN" WITH -SRC1 & +SRC2, S1L = S2L, /S1/ .GT. /S2/ SEQ 0074

```
2960  010530  001403                    BEQ     71$             ;BR IF OK
2961  010532  010637  000704            MOV     SP,@#BADR6      ;COPY BAD SP VALUE
2962  010536  104010                    ERROR   10              ;****************TEST 32 - ERROR 10***************
2963                                                            ;STACK POINTER NOT RESTORED BY INSTRUCTION
2964                                                            ;EXPECTED SP IS STORED AT "SAVR6"
2965                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
2966  010540                        71$:
2967  010540  000403                    BR      TST33           ;BR TO NEXT TEST
2968  010542                        S1T32:                      ;SOURCE1 STRING
2969  010542     070                     .BYTE   70              ;MOST SIGNIFICANT DIGIT
2970  010543     063                     .BYTE   63
2971  010544     161                     .BYTE   161
2972  010545                        S2T32:                      ;SOURCE2 STRING
2973  010545     061                     .BYTE   61              ;MOST SIGNIFICANT DIGIT
2974  010546     063                     .BYTE   63
2975  010547     070                     .BYTE   70
2976
2977                                    .EVEN
```

```
2978
2979
2980                                    ;;*****************************************************************
2981                                    ;*TEST 33       TEST "CMPN" WITH S1L = S2L, POSITIVE SOURCE2, SOURCE2 MAGNITUDE IS GREAT
2982                                    ;;*****************************************************************
2983  010550  000004                    TST33:  SCOPE
2984  010552  004567  004154                   JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
2985  010556  000004                            4                       ;SOURCE1 LENGTH
2986  010560  010722                            S1T33   ;SOURCE1 ADDRESS
2987  010562  000004                            4                       ;SOURCE2 LENGTH
2988  010564  010726                            S2T33                   ;SOURCE2 ADDRESS
2989  010566  000377                            377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
2990  010570  004567  004250                   JSR     R5,XPSW
2991  010574  000210                            .WORD   210
2992  010576  004767  004156                   JSR     PC,GENP         ;SET UP GENERAL REGISTERS
2993  010602  000277                            SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
2994  010604  000250                            CLN
2995
2996  010606  076052                            CMPN
2997
2998  010610  106767  170062                   MFPS    CCODES          ;STORE RESULTANT PSW
2999  010614  042767  177400  170054           BIC     #177400,CCODES  ;CLEAR UNUSED BITS
3000  010622  023767  000700  170046           CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
3001  010630  001401                           BEQ     64$             ;BR, IF EQUAL
3002  010632  104001                           ERROR   1               ;***************TEST 33 - ERROR 1***************
3003                                                                   ;PSW ERROR
3004                                                                   ;EXPECTED PSW IS STORED AT "SAVR5"
3005                                                                   ;ERRONEOUS SP VALUE IS AT "BADR6"
3006  010634                          64$:
3007  010634  005700                           TST     R0              ;CHECK R0=0
3008  010636  001401                           BEQ     65$
3009  010640  104002                           ERROR   2               ;***************TEST 33 - ERROR 2***************
3010                                                                   ;R0 SHOULD BE ZERO
3011  010642  005701                  65$:     TST     R1              ;CHECK R1=0
3012  010644  001401                           BEQ     66$
3013  010646  104003                           ERROR   3               ;***************TEST 33 - ERROR 3***************
3014                                                                   ;R1 SHOULD BE ZERO
3015  010650  005702                  66$:     TST     R2              ;CHECK R2=0
3016  010652  001401                           BEQ     67$
3017  010654  104004                           ERROR   4               ;***************TEST 33 - ERROR 4***************
3018                                                                   ;R2 SHOULD BE ZERO
3019  010656  005703                  67$:     TST     R3              ;CHECK R3=0
3020  010660  001401                           BEQ     68$
3021  010662  104005                           ERROR   5               ;***************TEST 33 - ERROR 5***************
3022                                                                   ;R3 SHOULD BE ZERO
3023  010664  020467  167764          68$:     CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
3024  010670  001401                           BEQ     69$             ;BR IF OK
3025  010672  104006                           ERROR   6               ;***************TEST 33 - ERROR 6***************
3026                                                                   ;R4 CHANGED
3027                                                                   ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
3028  010674  020567  167756          69$:     CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
3029  010700  001401                           BEQ     70$
3030  010702  104007                           ERROR   7               ;***************TEST 33 - ERROR 7***************
3031                                                                   ;R5 CHANGED
3032                                                                   ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
3033  010704  023706  000702          70$:     CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

```
.MAIN.  MACY11 27(1006)  21-DEC-76  11:53  PAGE 74
DVKAJA.P11    20-DEC-76 15:02          T33     TEST "CMPN" WITH S1L = S2L, POSITIVE SOURCE2, SOURCE2 MAGNITUDE IS GREATE  SEQ 0075

  3034  010710  001403                        BEQ     71$             ;BR IF OK
  3035  010712  010637  000704                MOV     SP,@#BADR6      ;COPY BAD SP VALUE
  3036  010716  104010                        ERROR   10              ;****************TEST 33 - ERROR 10****************
  3037                                                                ;STACK POINTER NOT RESTORED BY INSTRUCTION
  3038                                                                ;EXPECTED SP IS STORED AT "SAVR6"
  3039                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
  3040  010720                          71$:
  3041  010720  000404                        BR      TST34           ;BR TO NEXT TEST
  3042  010722                          S1T33:                        ;SOURCE1 STRING
  3043  010722      067                        .BYTE   67              ;MOST SIGNIFICANT DIGIT
  3044  010723      066                        .BYTE   66
  3045  010724      065                        .BYTE   65
  3046  010725      064                        .BYTE   64
  3047  010726                          S2T33:                        ;SOURCE2 STRING
  3048  010726      067                        .BYTE   67              ;MOST SIGNIFICANT DIGIT
  3049  010727      066                        .BYTE   66
  3050  010730      065                        .BYTE   65
  3051  010731      065                        .BYTE   65
  3052
  3053                                         .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 34       TEST "CMPN" WITH S2L .GT. S1L, SUCCESSFUL COMPARE
                                        ;;*****************************************************************
010732  000004                TST34:  SCOPE
010734  004567  003772                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
010740  000002                        2                       ;SOURCE1 LENGTH
010742  011104                        S1T34   ;SOURCE1 ADDRESS
010744  000004                        4                       ;SOURCE2 LENGTH
010746  011106                        S2T34                   ;SOURCE2 ADDRESS
010750  000377                        377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
010752  004567  004066                JSR     R5,XPSW
010756  000204                        .WORD   204
010760  004767  003774                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
010764  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
010766  000244                        CLZ

010770  076052                        CMPN

010772  106767  167700                MFPS    CCODES          ;STORE RESULTANT PSW
010776  042767  177400  167672        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
011004  023767  000700  167664        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
011012  001401                        BEQ     64$             ;BR, IF EQUAL
011014  104001                        ERROR   1               ;***************TEST 34 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
011016                          64$:
011016  005700                        TST     R0              ;CHECK R0=0
011020  001401                        BEQ     65$
011022  104002                        ERROR   2               ;***************TEST 34 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
011024  005701                  65$:  TST     R1              ;CHECK R1=0
011026  001401                        BEQ     66$
011030  104003                        ERROR   3               ;***************TEST 34 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
011032  005702                  66$:  TST     R2              ;CHECK R2=0
011034  001401                        BEQ     67$
011036  104004                        ERROR   4               ;***************TEST 34 - ERROR 4***************
                                                            ;R2 SHOULD BE ZERO
011040  005703                  67$:  TST     R3              ;CHECK R3=0
011042  001401                        BEQ     68$
011044  104005                        ERROR   5               ;***************TEST 34 - ERROR 5***************
                                                            ;R3 SHOULD BE ZERO
011046  020467  167602          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
011052  001401                        BEQ     69$             ;BR IF OK
011054  104006                        ERROR   6               ;***************TEST 34 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
011056  020567  167574          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
011062  001401                        BEQ     70$
011064  104007                        ERROR   7               ;***************TEST 34 - ERROR 7***************
                                                            ;R5 CHANGED
                                                            ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
011066  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

```
                        T34     TEST "CMPN" WITH S2L .GT. S1L, SUCCESSFUL COMPARE                    SEQ 0078

3110  011072  001403                    BEQ     71$             ;BR IF OK
3111  011074  010637  000704            MOV     SP,@#BADR6      ;COPY BAD SP VALUE
3112  011100  104010                    ERROR   10              ;****************TEST 34 - ERROR 10***************
3113                                                            ;STACK POINTER NOT RESTORED BY INSTRUCTION
3114                                                            ;EXPECTED SP IS STORED AT "SAVR6"
3115                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
3116  011102                        71$:
3117  011102  000403                    BR      TST35           ;BR TO NEXT TEST
3118  011104                        S1T34:                      ;SOURCE1 STRING
3119  011104     067                     .BYTE   67              ;MOST SIGNIFICANT DIGIT
3120  011105     071                     .BYTE   71
3121  011106                        S2T34:                      ;SOURCE2 STRING
3122  011106     060                     .BYTE   60              ;MOST SIGNIFICANT DIGIT
3123  011107     060                     .BYTE   60
3124  011110     067                     .BYTE   67
3125  011111     071                     .BYTE   71
3126
3127                                    .EVEN
```

```
3128
3129
3130                                    ;;*****************************************************************
3131                                    ;*TEST 35       TEST "CMPN" WITH NEGATIVE OPERANDS & SRC2 LENGTH .GT. SRC1 LENGTH, NON-Z
3132                                    ;;*****************************************************************
3133  011112  000004                    TST35:  SCOPE
3134  011114  004567  003612                    JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
3135  011120  000002                            2                       ;SOURCE1 LENGTH
3136  011122  011262                            S1T35   ;SOURCE1 ADDRESS
3137  011124  000004                            4                       ;SOURCE2 LENGTH
3138  011126  011264                            S2T35                   ;SOURCE2 ADDRESS
3139  011130  000377                            377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
3140  011132  004567  003706                    JSR     R5,XPSW
3141  011136  000200                            .WORD   200
3142  011140  004767  003614                    JSR     PC,GENR         ;SET UP GENERAL REGISTERS
3143  011144  000277                            SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
3144
3145  011146  076052                            CMPN
3146
3147  011150  106767  167522                    MFPS    CCODES          ;STORE RESULTANT PSW
3148  011154  042767  177400  167514            BIC     #177400,CCODES  ;CLEAR UNUSED BITS
3149  011162  023767  000700  167506            CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
3150  011170  001401                            BEQ     64$             ;BR, IF EQUAL
3151  011172  104001                            ERROR   1               ;***************TEST 35 - ERROR 1***************
3152                                                                    ;PSW ERROR
3153                                                                    ;EXPECTED PSW IS STORED AT "SAVR6"
3154                                                                    ;ERRONEOUS SP VALUE IS AT "BADR6"
3155  011174                            64$:
3156  011174  005700                            TST     R0              ;CHECK R0=0
3157  011176  001401                            BEQ     65$
3158  011200  104002                            ERROR   2               ;***************TEST 35 - ERROR 2***************
3159                                                                    ;R0 SHOULD BE ZERO
3160  011202  005701                    65$:    TST     R1              ;CHECK R1=0
3161  011204  001401                            BEQ     66$
3162  011206  104003                            ERROR   3               ;***************TEST 35 - ERROR 3***************
3163                                                                    ;R1 SHOULD BE ZERO
3164  011210  005702                    66$:    TST     R2              ;CHECK R2=0
3165  011212  001401                            BEQ     67$
3166  011214  104004                            ERROR   4               ;***************TEST 35 - ERROR 4***************
3167                                                                    ;R2 SHOULD BE ZERO
3168  011216  005703                    67$:    TST     R3              ;CHECK R3=0
3169  011220  001401                            BEQ     68$
3170  011222  104005                            ERROR   5               ;***************TEST 35 - ERROR 5***************
3171                                                                    ;R3 SHOULD BE ZERO
3172  011224  020467  167424            68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
3173  011230  001401                            BEQ     69$             ;BR IF OK
3174  011232  104006                            ERROR   6               ;***************TEST 35 - ERROR 6***************
3175                                                                    ;R4 CHANGED
3176                                                                    ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
3177  011234  020567  167416            69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
3178  011240  001401                            BEQ     70$
3179  011242  104007                            ERROR   7               ;***************TEST 35 - ERROR 7***************
3180                                                                    ;R5 CHANGED
3181                                                                    ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
3182  011244  023706  000702            70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
3183  011250  001403                            BEQ     71$             ;BR IF OK
```

T35 TEST "CMPN" WITH NEGATIVE OPERANDS & SRC2 LENGTH .GT. SRC1 LENGTH, NON-ZE SEQ 008C

```
3184  011252  010637  000704          MOV     SP,@#BADR6      ;COPY BAD SP VALUE
3185  011256  104010                  ERROR   10              ;****************TEST 35 - ERROR 10***************
3186                                                          ;STACK POINTER NOT RESTORED BY INSTRUCTION
3187                                                          ;EXPECTED SP IS STORED AT "SAVR6"
3188                                                          ;ERRONEOUS SP VALUE IS AT "BADR6"
3189  011260                      71$:
3190  011260  000403                  BR      TST36           ;BR TO NEXT TEST
3191  011262                      S1T35:                      ;SOURCE1 STRING
3192  011262     070                   .BYTE   70              ;MOST SIGNIFICANT DIGIT
3193  011263     161                   .BYTE   161
3194  011264                      S2T35:                      ;SOURCE2 STRING
3195  011264     061                   .BYTE   61              ;MOST SIGNIFICANT DIGIT
3196  011265     060                   .BYTE   60
3197  011266     070                   .BYTE   70
3198  011267     161                   .BYTE   161
3199
3200                                   .EVEN
```

```
3201
3202
3203                                    ;;*****************************************************************
3204                                    ;*TEST 36       TEST "CMPN" WITH POSITIVE OPERANDS & SRC2 LENGTH .GT. SRC1 LENGTH, NON-Z
3205                                    ;;*****************************************************************
3206  011270  000004                    T36:  SCOPE
3207  011272  004567  003434                  JSR     R5,NPREP          ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
3208  011276  000002                          2                         ;SOURCE1 LENGTH
3209  011300  011442                          S1T36   ;SOURCE1 ADDRESS
3210  011302  000004                          4                         ;SOURCE2 LENGTH
3211  011304  011445                          S2T36                     ;SOURCE2 ADDRESS
3212  011306  000377                          377                       ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
3213  011310  004567  003530                  JSR     R5,XPSW
3214  011314  000210                          .WORD   210
3215  011316  004767  003436                  JSR     PC,GENR           ;SET UP GENERAL REGISTERS
3216  011322  000277                          SCC                       ;SET UP THE COMPLEMENT OF EXPECTED CC'S
3217  011324  000250                          CLN
3218
3219  011326  076052                          CMPN
3220
3221  011330  106767  167342                  MFPS    CCODES            ;STORE RESULTANT PSW
3222  011334  042767  177400  167334          BIC     #177400,CCODES    ;CLEAR UNUSED BITS
3223  011342  023767  000700  167326          CMP     @#EXPPSW,CCODES   ;CHECK PSW AGAINST EXPECTED VALUE
3224  011350  001401                          BEQ     64$               ;BR, IF EQUAL
3225  011352  104001                          ERROR   1                 ;***************TEST 36 - ERROR 1***************
3226                                                                    ;PSW ERROR
3227                                                                    ;EXPECTED PSW IS STORED AT "SAVR6"
3228                                                                    ;ERRONEOUS SP VALUE IS AT "BADR6"
3229  011354                          64$:
3230  011354  005700                          TST     R0                ;CHECK R0=0
3231  011356  001401                          BEQ     65$
3232  011360  104002                          ERROR   2                 ;***************TEST 36 - ERROR 2***************
3233                                                                    ;R0 SHOULD BE ZERO
3234  011362  005701                  65$:    TST     R1                ;CHECK R1=0
3235  011364  001401                          BEQ     66$
3236  011366  104003                          ERROR   3                 ;***************TEST 36 - ERROR 3***************
3237                                                                    ;R1 SHOULD BE ZERO
3238  011370  005702                  66$:    TST     R2                ;CHECK R2=0
3239  011372  001401                          BEQ     67$
3240  011374  104004                          ERROR   4                 ;***************TEST 36 - ERROR 4***************
3241                                                                    ;R2 SHOULD BE ZERO
3242  011376  005703                  67$:    TST     R3                ;CHECK R3=0
3243  011400  001401                          BEQ     68$
3244  011402  104005                          ERROR   5                 ;***************TEST 36 - ERROR 5***************
3245                                                                    ;R3 SHOULD BE ZERO
3246  011404  020467  167244          68$:    CMP     R4,DSTLN          ;CHECK R4 UNCHANGED
3247  011410  001401                          BEQ     69$               ;BR IF OK
3248  011412  104006                          ERROR   6                 ;***************TEST 36 - ERROR 6***************
3249                                                                    ;R4 CHANGED
3250                                                                    ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
3251  011414  020567  167236          69$:    CMP     R5,DSTAD          ;CHECK R5 UNCHANGED
3252  011420  001401                          BEQ     70$
3253  011422  104007                          ERROR   7                 ;***************TEST 36 - ERROR 7***************
3254                                                                    ;R5 CHANGED
3255                                                                    ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
3256  011424  023706  000702          70$:    CMP     @#SAVR6,SP        ;VERIFY STACK POINTER IS RESTORED
```

```
3257  011430  001403                        BEQ     71$                ;BR IF OK
3258  011432  010637  000704                MOV     SP,@#BADR6         ;COPY BAD SP VALUE
3259  011436  104010                        ERROR   10                 ;****************TEST 36 - ERROR 10***************
3260                                                                   ;STACK POINTER NOT RESTORED BY INSTRUCTION
3261                                                                   ;EXPECTED SP IS STORED AT "SAVR6"
3262                                                                   ;ERRONEOUS SP VALUE IS AT "BADR6"
3263  011440                          71$:
3264  011440  000403                        BR      TST37              ;BR TO NEXT TEST
3265  011442                          S1T36:                           ;SOURCE1 STRING
3266  011442     070                         .BYTE   70                 ;MOST SIGNIFICANT DIGIT
3267  011443     061                         .BYTE   61
3268  011444     061                         .BYTE   61
3269  011445                          S2T36:                           ;SOURCE2 STRING
3270  011445     060                         .BYTE   60                 ;MOST SIGNIFICANT DIGIT
3271  011446     070                         .BYTE   70
3272  011447     061                         .BYTE   61
3273
3274                                         .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 37       TEST "CMPN" WITH S1L .GT. S2L, SUCCESSFUL COMPARE
                                        ;;*****************************************************************
011450  000004                TST37:  SCOPE
011452  004567  003254                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
011456  000004                        4                       ;SOURCE1 LENGTH
011460  011622                        S1T37   ;SOURCE1 ADDRESS
011462  000002                        2                       ;SOURCE2 LENGTH
011464  011626                        S2T37                   ;SOURCE2 ADDRESS
011466  000377                        377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
011470  004567  003350                JSR     R5,XPSW
011474  000204                        .WORD   204
011476  004767  003256                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
011502  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
011504  000244                        CLZ

011506  076052                        CMPN

011510  106767  167162                MFPS    CCODES          ;STORE RESULTANT PSW
011514  042767  177400  167154        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
011522  023767  000700  167146        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
011530  001401                        BEQ     64$             ;BR, IF EQUAL
011532  104001                        ERROR   1               ;****************TEST 37 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
011534                          64$:
011534  005700                        TST     R0              ;CHECK R0=0
011536  001401                        BEQ     65$
011540  104002                        ERROR   2               ;****************TEST 37 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
011542  005701                  65$:  TST     R1              ;CHECK R1=0
011544  001401                        BEQ     66$
011546  104003                        ERROR   3               ;****************TEST 37 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
011550  005702                  66$:  TST     R2              ;CHECK R2=0
011552  001401                        BEQ     67$
011554  104004                        ERROR   4               ;****************TEST 37 - ERROR 4***************
                                                            ;R2 SHOULD BE ZERO
011556  005703                  67$:  TST     R3              ;CHECK R3=0
011560  001401                        BEQ     68$
011562  104005                        ERROR   5               ;****************TEST 37 - ERROR 5***************
                                                            ;R3 SHOULD BE ZERO
011564  020467  167064          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
011570  001401                        BEQ     69$             ;BR IF OK
011572  104006                        ERROR   6               ;****************TEST 37 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
011574  020567  167056          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
011600  001401                        BEQ     70$
011602  104007                        ERROR   7               ;****************TEST 37 - ERROR 7***************
                                                            ;R5 CHANGED
                                                            ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
011604  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

T37 TEST "CMPN" WITH S1L .GT. S2L, SUCCESSFUL COMPARE SEQ 0084

```
3331  011610  001403                BEQ     71$             ;BR IF OK
3332  011612  010637  000704        MOV     SP,@#BADR6      ;COPY BAD SP VALUE
3333  011616  104010                ERROR   10              ;***************TEST 37 - ERROR 10***************
3334                                                        ;STACK POINTER NOT RESTORED BY INSTRUCTION
3335                                                        ;EXPECTED SP IS STORED AT "SAVR6"
3336                                                        ;ERRONEOUS SP VALUE IS AT "BADR6"
3337  011620                    71$:
3338  011620  000403                BR      TST40           ;BR TO NEXT TEST
3339  011622                    S1T37:                      ;SOURCE1 STRING
3340  011622     060                .BYTE   60              ;MOST SIGNIFICANT DIGIT
3341  011623     060                .BYTE   60
3342  011624     071                .BYTE   71
3343  011625     070                .BYTE   70
3344  011626                    S2T37:                      ;SOURCE2 STRING
3345  011626     071                .BYTE   71              ;MOST SIGNIFICANT DIGIT
3346  011627     070                .BYTE   70
3347
3348                                .EVEN
```

```
3349
3350
3351                                    ;;*****************************************************************
3352                                    ;*TEST 40       TEST "CMPN" WITH S1L .GT. S2L, NEGATIVE SOURCE1, NON-ZERO IN EXCESS
3353                                    ;;*****************************************************************
3354  011630  000004                    T$T40:  SCOPE
3355  011632  004567  003074                    JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
3356  011636  000004                            4                       ;SOURCE1 LENGTH
3357  011640  012002                            S1T40   ;SOURCE1 ADDRESS
3358  011642  000002                            2                       ;SOURCE2 LENGTH
3359  011644  012006                            S2T40                   ;SOURCE2 ADDRESS
3360  011646  000377                            377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
3361  011650  004567  003170                    JSR     R5,XPSW
3362  011654  000210                            .WORD   210
3363  011656  004767  003076                    JSR     PC,GENP         ;SET UP GENERAL REGISTERS
3364  011662  000277                            SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
3365  011664  000250                            CLN
3366
3367  011666  076052                            CMPN
3368
3369  011670  106767  167002                    MFPS    CCODES          ;STORE RESULTANT PSW
3370  011674  042767  177400  166774            BIC     #177400,CCODES  ;CLEAR UNUSED BITS
3371  011702  023767  000700  166756            CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
3372  011710  001401                            BEQ     64$             ;BR, IF EQUAL
3373  011712  104001                            ERROR   1               ;***************TEST 40 - ERROR 1***************
3374                                                                    ;PSW ERROR
3375                                                                    ;EXPECTED PSW IS STORED AT "SAVR6"
3376                                                                    ;ERRONEOUS SP VALUE IS AT "BADR6"
3377  011714                            64$:
3378  011714  005700                            TST     R0              ;CHECK R0=0
3379  011716  001401                            BEQ     65$
3380  011720  104002                            ERROR   2               ;***************TEST 40 - ERROR 2***************
3381                                                                    ;R0 SHOULD BE ZERO
3382  011722  005701                    65$:    TST     R1              ;CHECK R1=0
3383  011724  001401                            BEQ     66$
3384  011726  104003                            ERROR   3               ;***************TEST 40 - ERROR 3***************
3385                                                                    ;R1 SHOULD BE ZERO
3386  011730  005702                    66$:    TST     R2              ;CHECK R2=0
3387  011732  001401                            BEQ     67$
3388  011734  104004                            ERROR   4               ;***************TEST 40 - ERROR 4***************
3389                                                                    ;R2 SHOULD BE ZERO
3390  011736  005703                    67$:    TST     R3              ;CHECK R3=0
3391  011740  001401                            BEQ     68$
3392  011742  104005                            ERROR   5               ;***************TEST 40 - ERROR 5***************
3393                                                                    ;R3 SHOULD BE ZERO
3394  011744  020467  166704            68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
3395  011750  001401                            BEQ     69$             ;BR IF OK
3396  011752  104006                            ERROR   6               ;***************TEST 40 - ERROR 6***************
3397                                                                    ;R4 CHANGED
3398                                                                    ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
3399  011754  020567  166676            69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
3400  011760  001401                            BEQ     70$
3401  011762  104007                            ERROR   7               ;***************TEST 40 - ERROR 7***************
3402                                                                    ;R5 CHANGED
3403                                                                    ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
3404  011764  023706  000702            70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

```
3405  011770  001403                        BEQ     71$                ;BR IF OK
3406  011772  010637  000704                MOV     SP,@#BADR6         ;COPY BAD SP VALUE
3407  011776  104010                        ERROR   10                 ;****************TEST 40 - ERROR 10***************
3408                                                                    ;STACK POINTER NOT RESTORED BY INSTRUCTION
3409                                                                    ;EXPECTED SP IS STORED AT "SAVR6"
3410                                                                    ;ERRONEOUS SP VALUE IS AT "BACR6"
3411  012000                          71$:
3412  012000  000403                        BR      TST41              ;BR TO NEXT TEST
3413  012002                          S1T4C:                            ;SOURCE1 STRING
3414  012002     061                         .BYTE   61                 ;MOST SIGNIFICANT DIGIT
3415  012003     060                         .BYTE   60
3416  012004     063                         .BYTE   63
3417  012005     167                         .BYTE   167
3418  012006                          S2T4C:                            ;SOURCE2 STRING
3419  012006     063                         .BYTE   63                 ;MOST SIGNIFICANT DIGIT
3420  012007     167                         .BYTE   167
3421
3422                                         .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 41       TEST "CMPN" WITH S1L .GT. S2L, POSITIVE SOURCE1, NON-ZERO IN EXCESS
                                        ;;*****************************************************************
012010  000004                  TST41:  SCOPE
012012  004567  002714                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
012016  000004                          4                       ;SOURCE1 LENGTH
012020  012160                          S1T41   ;SOURCE1 ADDRESS
012022  000002                          2                       ;SOURCE2 LENGTH
012024  012164                          S2T41                   ;SOURCE2 ADDRESS
012026  000377                          377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
012030  004567  003010                  JSR     R5,XPSW
012034  000200                          .WORD   200
012036  004767  002716                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
012042  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S

012044  076052                          CMPN

012046  106767  166624                  MFPS    CCODES          ;STORE RESULTANT PSW
012052  042767  177400  166616          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
012060  023767  000700  166610          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
012066  001401                          BEQ     64$             ;BR, IF EQUAL
012070  104001                          ERROR   1               ;***************TEST 41 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
012072                          64$:
012072  005700                          TST     R0              ;CHECK R0=0
012074  001401                          BEQ     65$
012076  104002                          ERROR   2               ;***************TEST 41 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
012100  005701                  65$:    TST     R1              ;CHECK R1=0
012102  001401                          BEQ     66$
012104  104003                          ERROR   3               ;***************TEST 41 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
012106  005702                  66$:    TST     R2              ;CHECK R2=0
012110  001401                          BEQ     67$
012112  104004                          ERROR   4               ;***************TEST 41 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
012114  005703                  67$:    TST     R3              ;CHECK R3=0
012116  001401                          BEQ     68$
012120  104005                          ERROR   5               ;***************TEST 41 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
012122  020467  166526          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
012126  001401                          BEQ     69$             ;BR IF OK
012130  104006                          ERROR   6               ;***************TEST 41 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
012132  020567  166520          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
012136  001401                          BEQ     70$
012140  104007                          ERROR   7               ;***************TEST 41 - ERROR 7***************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
012142  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
012146  001403                          BEQ     71$             ;BR IF OK
```

```
3479  012150  010637  000704                 MOV     SP,@#BADR6      ;COPY BAD SP VALUE
3480  012154  104010                         ERROR   10              ;****************TEST 41 - ERROR 10***************
3481                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
3482                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
3483                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
3484  012156                          71$:
3485  012156  000403                         BR      TST42           ;BR TO NEXT TEST
3486  012160                          S1T41:                          ;SOURCE1 STRING
3487  012160     061                          .BYTE   61              ;MOST SIGNIFICANT DIGIT
3488  012161     060                          .BYTE   60
3489  012162     063                          .BYTE   63
3490  012163     067                          .BYTE   67
3491  012164                          S2T41:                          ;SOURCE2 STRING
3492  012164     063                          .BYTE   63              ;MOST SIGNIFICANT DIGIT
3493  012165     067                          .BYTE   67
3494
3495                                          .EVEN
```

```
                                        ;;*****************************************************************
                                        ;*TEST 42       TEST "CMPN" WITH POSITIVE OPERANDS, /S1/ .GT. /S2/
                                        ;;*****************************************************************
012166  000004                TST42:  SCOPE
012170  004567  002536                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
012174  000003                        3                       ;SOURCE1 LENGTH
012176  012336                        S1T42   ;SOURCE1 ADDRESS
012200  000003                        3                       ;SOURCE2 LENGTH
012202  012341                        S2T42                   ;SOURCE2 ADDRESS
012204  000377                        377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
012206  004567  002632                JSR     R5,XPSW
012212  000200                        .WORD   200
012214  004767  002540                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
012220  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S

012222  076052                        CMPN

012224  106767  166446                MFPS    CCODES          ;STORE RESULTANT PSW
012230  042767  177400  166440        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
012236  023767  000700  166432        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
012244  001401                        BEQ     64$             ;BR, IF EQUAL
012246  104001                        ERROR   1               ;***************TEST 42 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR5"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
012250                          64$:
012250  005700                        TST     R0              ;CHECK R0=0
012252  001401                        BEQ     65$
012254  104002                        ERROR   2               ;***************TEST 42 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
012256  005701                  65$:  TST     R1              ;CHECK R1=0
012260  001401                        BEQ     66$
012262  104003                        ERROR   3               ;***************TEST 42 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
012264  005702                  66$:  TST     R2              ;CHECK R2=0
012266  001401                        BEQ     67$
012270  104004                        ERROR   4               ;***************TEST 42 - ERROR 4***************
                                                            ;R2 SHOULD BE ZERO
012272  005703                  67$:  TST     R3              ;CHECK R3=0
012274  001401                        BEQ     68$
012276  104005                        ERROR   5               ;***************TEST 42 - ERROR 5***************
                                                            ;R3 SHOULD BE ZERO
012300  020467  166350          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
012304  001401                        BEQ     69$             ;BR IF OK
012306  104006                        ERROR   6               ;***************TEST 42 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
012310  020567  166342          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
012314  001401                        BEQ     70$
012316  104007                        ERROR   7               ;***************TEST 42 - ERROR 7***************
                                                            ;R5 CHANGED
                                                            ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
012320  023706  000702          70$:  CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
```

```
3552  012324  001403                    BEQ     71$             ;BR IF OK
3553  012326  010637  000704            MOV     SP,@#BADR6      ;COPY BAD SP VALUE
3554  012332  104010                    ERROR   10              ;****************TEST 42 - ERROR 10***************
3555                                                            ;STACK POINTER NOT RESTORED BY INSTRUCTION
3556                                                            ;EXPECTED SP IS STORED AT "SAVR6"
3557                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
3558  012334                        71$:
3559  012334  000403                    BR      TST43           ;BR TO NEXT TEST
3560  012336                        S1T42:                      ;SOURCE1 STRING
3561  012336     067                        .BYTE   67          ;MOST SIGNIFICANT DIGIT
3562  012337     065                        .BYTE   65
3563  012340     064                        .BYTE   64
3564  012341                        S2T42:                      ;SOURCE2 STRING
3565  012341     067                        .BYTE   67          ;MOST SIGNIFICANT DIGIT
3566  012342     065                        .BYTE   65
3567  012343     063                        .BYTE   63
3568
3569                                       .EVEN
```

```
                                ;;*****************************************************************
                                ;*TEST 43       TEST "CMPN" WITH NEGATIVE OPERANDS, /S1/ .GT. /S2/
                                ;;*****************************************************************
012344  000304                  TST43:  SCOPE
012346  004567  002360                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
012352  000003                          3                       ;SOURCE1 LENGTH
012354  012514                          S1T43   ;SOURCE1 ADDRESS
012356  000003                          3                       ;SOURCE2 LENGTH
012360  012517                          S2T43                   ;SOURCE2 ADDRESS
012362  000377                          377                     ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
012364  004567  002454                  JSR     R5,XPSW
012370  000210                          .WORD   210
012372  004767  002362                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
012376  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S

012400  076052                          CMPN

012402  106767  166270                  MFPS    CCODES          ;STORE RESULTANT PSW
012406  042767  177400  166262          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
012414  023767  000700  166254          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
012422  001401                          BEQ     64$             ;BR, IF EQUAL
012424  104001                          ERROR   1               ;***************TEST 43 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
012426                          64$:
012426  005700                          TST     R0              ;CHECK R0=0
012430  001401                          BEQ     65$
012432  104002                          ERROR   2               ;***************TEST 43 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
012434  005701                  65$:    TST     R1              ;CHECK R1=0
012436  001401                          BEQ     66$
012440  104003                          ERROR   3               ;***************TEST 43 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
012442  005702                  66$:    TST     R2              ;CHECK R2=0
012444  001401                          BEQ     67$
012446  104004                          ERROR   4               ;***************TEST 43 - ERROR 4***************
                                                                ;R2 SHOULD BE ZERO
012450  005703                  67$:    TST     R3              ;CHECK R3=0
012452  001401                          BEQ     68$
012454  104005                          ERROR   5               ;***************TEST 43 - ERROR 5***************
                                                                ;R3 SHOULD BE ZERO
012456  020467  166172          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
012462  001401                          BEQ     69$             ;BR IF OK
012464  104006                          ERROR   6               ;***************TEST 43 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
012466  020567  166164          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
012472  001401                          BEQ     70$
012474  104007                          ERROR   7               ;***************TEST 43 - ERROR 7***************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
012476  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
012502  001403                          BEQ     71$             ;BR IF OK
```

```
3626  012504  010637  00C704                  MOV     SP,@#BADR5      ;COPY BAD SP VALUE
3627  012510  104010                          ERROR   10              ;****************TEST 43 - ERROR 10***************
3628                                                                  ;STACK POINTER NOT RESTORED BY INSTRUCTION
3629                                                                  ;EXPECTED SP IS STORED AT "SAVR6"
3630                                                                  ;ERRONEOUS SP VALUE IS AT "BADR6"
3631  012512                          71$:
3632  012512  000403                          BR      TST44           ;BR TO NEXT TEST
3633  012514                          S1T43:                          ;SOURCE1 STRING
3634  012514     067                          .BYTE   67              ;MOST SIGNIFICANT DIGIT
3635  012515     065                          .BYTE   65
3636  012516     164                          .BYTE   164
3637  012517                          S2T43:                          ;SOURCE2 STRING
3638  012517     067                          .BYTE   67              ;MOST SIGNIFICANT DIGIT
3639  012520     065                          .BYTE   65
3640  012521     163                          .BYTE   163
3641
3642                                          .EVEN
```

```
                                ;;*****************************************************************
                                ;*TEST 44       TEST INTERRUPTABILITY OF "CMPN"
                                ;;*****************************************************************
012522  000004                  TST44:  SCOPE
012524  105777  166010                  TSTB    @$SWR           ;TEST BIT 7 OF SWR
012530  100535                          BMI     TST45           ;SKIP TO NEXT TEST IF SET
012532  026767  166012  166124          CMP     $TPS,TCSR       ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
012540  001007                          BNE     T44CONT         ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
012542  032767  000001  166036          BIT     #BIT0,$ENV      ;IF YES, IS PROGRAM UNDER APT?
012550  001403                          BEQ     T44CONT         ;BR, IF NOT
012552  005767  166016                  TST     $PASS           ;IF YES,CHECK IF NOT ON FIRST PASS
012556  001122                          BNE     TST45           ;IF NOT, BR & SKIP TEST
012560                          T44CONT:
012560  004567  002146                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
012564  000004                                  4               ;SOURCE1 LENGTH
012566  013002                                  S1T44   ;SOURCE1 ADDRESS
012570  000004                                  4               ;SOURCE2 LENGTH
012572  013006                                  S2T44           ;SOURCE2 ADDRESS
012574  000377                                  377             ;STORE NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CMPN" IN
012576  012767  012656  166070          MOV     #CMPNPC,PC1     ;STORE PC OF TEST INSTRUCTION
012604  012777  015114  166056          MOV     #INTR,@TVECT    ;POINT TTY VECTOR TO INTERRUPT ROUTINE
012612  005077  166054                  CLR     @TPSW           ;ALLOW INTERRUPTS AFTER TTY INTERRJPT
012616  004767  002246                  JSR     PC,TDONE        ;WAIT FOR SLU READY
012622  013777  000554  166036          MOV     @#$NULL,@TBUF   ;SEND NULL CHARACTER
012630  004567  002210                  JSR     R5,XPSW         ;STORE EXPECTED PSW
012634  000000                          .WORD   0
012636  106427  000000                  MTPS    #0              ;ALLOW INTERRUPTS
012642  052777  000100  166014          BIS     #100,@TCSR      ;ENABLE TTY INTERRUPTS
012650  004767  002104          RECMPN: JSR     PC,GENR         ;SET UP GENERAL REGISTERS
012654  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
012656  076052                  CMPNPC: CMPN
012660  106767  166012                  MFPS    CCODES          ;STORE RESULTANT PSW
012664  032777  000100  165772          BIT     #100,@TCSR      ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
012672  001366                          BNE     RECMPN          ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
012674  042767  177400  165774          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
012702  023767  000700  165766          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
012710  001401                          BEQ     64$             ;BR, IF EQUAL
012712  104001                          ERROR   1               ;***************TEST 44 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
012714                          64$:
012714  005700                          TST     R0              ;CHECK R0=0
012716  001401                          BEQ     65$
012720  104002                          ERROR   2               ;***************TEST 44 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
012722  005701                  65$:    TST     R1              ;CHECK R1=0
012724  001401                          BEQ     66$
012726  104003                          ERROR   3               ;***************TEST 44 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
012730  005702                  66$:    TST     R2              ;CHECK R2=0
012732  001401                          BEQ     67$
```

```
012734  104004                          ERROR   4               ;****************TEST 44 - ERROR 4****************
                                                                ;R2 SHOULD BE ZERO
012736  005703                  67$:    TST     R3              ;CHECK R3=0
012740  001401                          BEQ     68$
012742  104005                          ERROR   5               ;****************TEST 44 - ERROR 5****************
                                                                ;R3 SHOULD BE ZERO
012744  020467  165704          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
012750  001401                          BEQ     69$             ;BR IF OK
012752  104006                          ERROR   6               ;****************TEST 44 - ERROR 6****************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL CONTENTS OF "FILL"
012754  020567  165676          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
012760  001401                          BEQ     70$
012762  104007                          ERROR   7               ;****************TEST 44 - ERROR 7****************
                                                                ;R5 CHANGED
                                                                ;R5 SHOULD STILL EQUAL CONTENTS OF "DSTAD"
012764  023706  000702          70$:    CMP     @#SAVR6,SP      ;VERIFY STACK POINTER IS RESTORED
012770  001403                          BEQ     71$             ;BR IF OK
012772  010637  000704                  MOV     SP,@#BADR6      ;COPY BAD SP VALUE
012776  104010                          ERROR   10              ;****************TEST 44 - ERROR 10****************
                                                                ;STACK POINTER NOT RESTORED BY INSTRUCTION
                                                                ;EXPECTED SP IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
013000                          71$:
013000  000404                          BR      ENDT44          ;BR TO END OF THIS TEST
013002                          S1T44:                          ;SOURCE1 STRING
013002     071                          .BYTE   71              ;MOST SIGNIFICANT DIGIT
013003     070                          .BYTE   70
013004     067                          .BYTE   67
013005     066                          .BYTE   66
013006                          S2T44:                          ;SOURCE2 STRING
013006     071                          .BYTE   71              ;MOST SIGNIFICANT DIGIT
013007     070                          .BYTE   70
013010     067                          .BYTE   67
013011     065                          .BYTE   65

                                        .EVEN
013012  016777  165654  165650  ENDT44: MOV     TPSW,@TVECT
013020  106427  000200                  MTPS    #200
```

```
                                        ;;*****************************************************************
                                        ;*TEST 45        TEST "CVTNL" WITH SRC = +2,147,483,647
                                        ;;*****************************************************************
013024  000004                          TST45:  SCOPE
013026  004567  001700                          JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
013032  000012                                          12              ;SOURCE LENGTH
013034  013164                                          ST45            ;SOURCE ADDRESS
013036  177777                                          177777          ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
013040  177777                                          177777
013042  000377                                          377             ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
013044  004567  001774                          JSR     R5,XPSW
013050  000200                                  .WORD   200
013052  004767  001702                          JSR     PC,GENR         ;SET UP GENERAL REGISTERS
013056  000277                                  SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S

013060  076053                                  CVTNL

013062  106767  165610                          MFPS    CCODES          ;STORE RESULTANT PSW
013066  042767  177400  165602                  BIC     #177400,CCODES  ;CLEAR UNUSED BITS
013074  023767  000700  165574                  CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
013102  001401                                  BEQ     64$             ;BR, IF EQUAL
013104  104001                                  ERROR   1               ;***************TEST 45 - ERROR 1***************
                                                                        ;PSW ERROR
                                                                        ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                        ;ERRONEOUS SP VALUE IS AT "BADR6"
013106                                  64$:
013106  005700                                  TST     R0              ;CHECK R0=0
013110  001401                                  BEQ     65$
013112  104002                                  ERROR   2               ;***************TEST 45 - ERROR 2***************
                                                                        ;R0 SHOULD BE ZERO
013114  005701                          65$:    TST     R1              ;CHECK R1=0
013116  001401                                  BEQ     66$
013120  104003                                  ERROR   3               ;***************TEST 45 - ERROR 3***************
                                                                        ;R1 SHOULD BE ZERO
013122  020227  077777                  66$:    CMP     R2,#077777      ;CHECK UPPER WORD OF ANSWER
013126  001401                                  BEQ     67$             ;BR IF OK
013130  104004                                  ERROR   4               ;***************TEST 45 - ERROR 4***************
                                                                        ;UPPER WORD OF ANSWER IS IN ERROR
                                                                        ;EXPECTED VALUE IS 077777
                                                                        ;ERRONEOUS ANSWER VALUE IS IN R2
013132  020327  177777                  67$:    CMP     R3,#177777      ;CHECK LOWER WORD OF ANSWER
013136  001401                                  BEQ     68$             ;BR IF OK
013140  104005                                  ERROR   5               ;***************TEST 45 - ERROR 5***************
                                                                        ;LOWER WORD OF ANSWER IS IN ERROR
                                                                        ;EXPECTED VALUE IS 177777
                                                                        ;ERRORNEOUS ANSWER IS IN R3
013142  020467  165506                  68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
013146  001401                                  BEQ     69$
013150  104006                                  ERROR   6               ;***************TEST 45 - ERROR 6***************
                                                                        ;R4 CHANGED
                                                                        ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
013152  020567  165500                  69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
013156  001401                                  BEQ     70$             ;BR IF OK
```

T45 TEST "CVTNL" WITH SRC = +2,147,483,647 SEQ 009E

```
3794  013160  104007                ERROR   7               ;****************TEST 45 - ERROR 7***************
3795                                                        ;R5 CHANGED
3796                                                        ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
3797  013162                  70$:
3798  013162  000405                BR      TST46           ;BR TO NEXT TEST
3799  013164                  ST45:                         ;SOURCE STRING
3800  013164     062                  .BYTE   62              ;MOST SIGNIFICANT DIGIT
3801  013165     061                  .BYTE   61
3802  013166     064                  .BYTE   64
3803  013167     067                  .BYTE   67
3804  013170     064                  .BYTE   64
3805  013171     070                  .BYTE   70
3806  013172     063                  .BYTE   63
3807  013173     066                  .BYTE   66
3808  013174     064                  .BYTE   64
3809  013175     067                  .BYTE   67
3810
```

```
                                ;;*****************************************************************
                                ;*TEST 46       TEST "CVTNL" WITH SRC= +2,687,483,648, OVERFLOW WITH CORRECT SIGN
                                ;;*****************************************************************
013176  000004                T46:    SCOPE
013200  004567  001526                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
013204  000012                        12                      ;SOURCE LENGTH
013206  013340                        ST46                    ;SOURCE ADDRESS
013210  177777                        177777                  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
013212  177777                        177777
013214  000377                        377                     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
013216  004567  001622                JSR     R5,XPSW
013222  000202                        .WORD   202
013224  004767  001530                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
013230  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
013232  000242                        CLV

013234  076053                        CVTNL

013236  106767  165434                MFPS    CCODES          ;STORE RESULTANT PSW
013242  042767  177400  165426        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
013250  023767  000700  165420        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
013256  001401                        BEQ     64$             ;BR, IF EQUAL
013260  104001                        ERROR   1               ;***************TEST 46 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"

013262                          64$:
013262  005700                        TST     R0              ;CHECK R0=0
013264  001401                        BEQ     65$
013266  104002                        ERROR   2               ;***************TEST 46 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
013270  005701                  65$:  TST     R1              ;CHECK R1=0
013272  001401                        BEQ     66$
013274  104003                        ERROR   3               ;***************TEST 46 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
013276  020227  014631          66$:  CMP     R2,#014631      ;CHECK UPPER WORD OF ANSWER
013302  001401                        BEQ     67$             ;BR IF OK
013304  104004                        ERROR   4               ;***************TEST 46 - ERROR 4***************
                                                            ;UPPER WORD OF ANSWER IS IN ERROR
                                                            ;EXPECTED VALUE IS 014631
                                                            ;ERRONEOUS ANSWER VALUE IS IN R2

013306  020327  031462          67$:  CMP     R3,#031462      ;CHECK LOWER WORD OF ANSWER
013312  001401                        BEQ     68$             ;BR IF OK
013314  104005                        ERROR   5               ;***************TEST 46 - ERROR 5***************
                                                            ;LOWER WORD OF ANSWER IS IN ERROR
                                                            ;EXPECTED VALUE IS 031462
                                                            ;ERRORNEOUS ANSWER IS IN R3

013316  020467  165332          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
013322  001401                        BEQ     69$
013324  104006                        ERROR   6               ;***************TEST 46 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"

013326  020567  165324          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
```

```
                        T46     TEST "CVTNL" WITH SRC= +2,687,483,648, OVERFLOW WITH CORRECT SIGN          SEQ 0098

 3867  013332  001401                BEQ     70$             ;BR IF OK
 3868  013334  104007                ERROR   7               ;****************TEST 46 - ERROR 7***************
 3869                                                        ;R5 CHANGED
 3870                                                        ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
 3871  013336                    70$:
 3872  013336  000405                BR      TST47           ;BR TO NEXT TEST
 3873  013340                    ST46:                       ;SOURCE STRING
 3874  013340      064               .BYTE   64              ;MOST SIGNIFICANT DIGIT
 3875  013341      062               .BYTE   62
 3876  013342      071               .BYTE   71
 3877  013343      064               .BYTE   64
 3878  013344      071               .BYTE   71
 3879  013345      066               .BYTE   66
 3880  013346      067               .BYTE   67
 3881  013347      062               .BYTE   62
 3882  013350      071               .BYTE   71
 3883  013351      066               .BYTE   66
 3884
```

```
                                ;;*****************************************************************
                                ;*TEST 47       TEST "CVTNL" WITH SRC = +2,147,483,648, OVERFLOW
                                ;;*****************************************************************
013352  000004                 ST47:  SCOPE
013354  004567  001352                 JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
013360  000012                         12                      ;SOURCE LENGTH
013362  013514                         ST47                    ;SOURCE ADDRESS
013364  177777                         177777                  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
013366  177777                         177777
013370  000377                         377                     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
013372  004567  001446                 JSR     R5,XPSW
013376  000212                         .WORD   212
013400  004767  001354                 JSR     PC,GENR         ;SET UP GENERAL REGISTERS
013404  000277                         SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
013406  000242                         CLV

013410  076053                         CVTNL

013412  106767  165260                 MFPS    CCODES          ;STORE RESULTANT PSW
013416  042767  177400  165252         BIC     #177400,CCODES  ;CLEAR UNUSED BITS
013424  023767  000700  165244         CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
013432  001401                         BEQ     64$             ;BR, IF EQUAL
013434  104001                         ERROR   1               ;***************TEST 47 - ERROR 1***************
                                                               ;PSW ERROR
                                                               ;EXPECTED PSW IS STORED AT "SAVR5"
                                                               ;ERRONEOUS SP VALJE IS AT "BADR6"
013436                          64$:
013436  005700                         TST     R0              ;CHECK R0=0
013440  001401                         BEQ     65$
013442  104002                         ERROR   2               ;***************TEST 47 - ERROR 2***************
                                                               ;R0 SHOULD BE ZERO
013444  005701                 65$:    TST     R1              ;CHECK R1=0
013446  001401                         BEQ     66$
013450  104003                         ERROR   3               ;***************TEST 47 - ERROR 3***************
                                                               ;R1 SHOULD BE ZERO
013452  020227  100000         66$:    CMP     R2,#100000      ;CHECK UPPER WORD OF ANSWER
013456  001401                         BEQ     67$             ;BR IF OK
013460  104004                         ERROR   4               ;***************TEST 47 - ERROR 4***************
                                                               ;UPPER WORD OF ANSWER IS IN ERROR
                                                               ;EXPECTED VALUE IS 100000
                                                               ;ERRONEOUS ANSWER VALUE IS IN R2
013462  020327  000000         67$:    CMP     R3,#0   ;CHECK LOWER WORD OF ANSWER
013466  001401                         BEQ     68$             ;BR IF OK
013470  104005                         ERROR   5               ;***************TEST 47 - ERROR 5***************
                                                               ;LOWER WORD OF ANSWER IS IN ERROR
                                                               ;EXPECTED VALUE IS 0
                                                               ;ERRORNEOUS ANSWER IS IN R3
013472  020467  165156         68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
013476  001401                         BEQ     69$
013500  104006                         ERROR   6               ;***************TEST 47 - ERROR 6***************
                                                               ;R4 CHANGED
                                                               ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
013502  020567  165150         69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
013506  001401                         BEQ     70$             ;BR IF OK
```

```
                        T47     TEST "CVTNL" WITH SRC = +2,147,483,648. OVERFLOW                SEQ 0100

3941  013510  104007                ERROR   7               ;***************TEST 47 - ERROR 7***************
3942                                                        ;R5 CHANGED
3943                                                        ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
3944  013512                  70$:
3945  013512  000405                BR      TST50           ;BR TO NEXT TEST
3946  013514                  ST47:                         ;SOURCE STRING
3947  013514     062                  .BYTE   62              ;MOST SIGNIFICANT DIGIT
3948  013515     061                  .BYTE   61
3949  013516     064                  .BYTE   64
3950  013517     067                  .BYTE   67
3951  013520     064                  .BYTE   64
3952  013521     070                  .BYTE   70
3953  013522     063                  .BYTE   63
3954  013523     066                  .BYTE   66
3955  013524     064                  .BYTE   64
3956  013525     070                  .BYTE   70
3957
```

```
                                        ;;*****************************************************************
                                        ;*TEST 50       TEST "CVTNL" WITH SRC = -2,147,483,648
                                        ;;*****************************************************************
013526  000004                  TST50:  SCOPE
013530  004567  001176                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
013534  000012                          12                      ;SOURCE LENGTH
013536  013670                          ST50                    ;SOURCE ADDRESS
013540  177777                          177777                  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
013542  177777                          177777
013544  000377                          377                     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
013546  004567  001272                  JSR     R5,XPSW
013552  000210                          .WORD   210
013554  004767  001200                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
013560  000277                          SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
013562  000250                          CLN

013564  076053                          CVTNL   .

013566  106767  165104                  MFPS    CCODES          ;STORE RESULTANT PSW
013572  042767  177400  165076          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
013600  023767  000700  165070          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
013606  001401                          BEQ     64$             ;BR, IF EQUAL
013610  104001                          ERROR   1               ;***************TEST 50 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
013612                          64$:
013612  005700                          TST     R0              ;CHECK R0=0
013614  001401                          BEQ     65$
013616  104002                          ERROR   2               ;***************TEST 50 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
013620  005701                  65$:    TST     R1              ;CHECK R1=0
013622  001401                          BEQ     66$
013624  104003                          ERROR   3               ;***************TEST 50 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
013626  020227  100000          66$:    CMP     R2,#100000      ;CHECK UPPER WORD OF ANSWER
013632  001401                          BEQ     67$             ;BR IF OK
013634  104004                          ERROR   4               ;***************TEST 50 - ERROR 4***************
                                                                ;UPPER WORD OF ANSWER IS IN ERROR
                                                                ;EXPECTED VALUE IS 100000
                                                                ;ERRONEOUS ANSWER VALUE IS IN R2
013636  020327  000000          67$:    CMP     R3,#0   ;CHECK LOWER WORD OF ANSWER
013642  001401                          BEQ     68$             ;BR IF OK
013644  104005                          ERROR   5               ;***************TEST 50 - ERROR 5***************
                                                                ;LOWER WORD OF ANSWER IS IN ERROR
                                                                ;EXPECTED VALUE IS 0
                                                                ;ERRORNEOUS ANSWER IS IN R3
013646  020467  165302          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
013652  001401                          BEQ     69$
013654  104006                          ERROR   6               ;***************TEST 50 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
013656  020567  164774          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
013662  001401                          BEQ     70$             ;BR IF OK
```

```
013664  104007                  ERROR   7       ;***************TEST 50 - ERROR 7***************
                                                ;R5 CHANGED
                                                ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
013666                  70$:
013666  000405                  BR      TST51   ;BR TO NEXT TEST
013670                  ST50:                   ;SOURCE STRING
013670     062                  .BYTE   62      ;MOST SIGNIFICANT DIGIT
013671     061                  .BYTE   61
013672     064                  .BYTE   64
013673     067                  .BYTE   67
013674     064                  .BYTE   64
013675     070                  .BYTE   70
013676     063                  .BYTE   63
013677     066                  .BYTE   66
013700     064                  .BYTE   64
013701     170                  .BYTE   170
```

```
                                        ;;*****************************************************************
                                        ;*TEST 51       TEST "CVTNL" WITH SRC = -2,147,483,649, OVERFLOW
                                        ;;*****************************************************************
013702  000004                  TST51:  SCOPE
013704  004567  001022                  JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
013710  000012                          12                      ;SOURCE LENGTH
013712  014044                          ST51                    ;SOURCE ADDRESS
013714  177777                          177777                  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
013716  177777                          177777
013720  000377                          377                     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
013722  004567  001116                  JSR     R5,XPSW
013726  000202                          .WORD   202
013730  004767  001024                  JSR     PC,GENR         ;SET UP GENERAL REGISTERS
013734  000265                          +SEZ!SEC                        ;SET UP THE COMPLEMENT OF EXPECTED CC'S
013736  000252                          +CLN!CLV

013740  076053                          CVTNL

013742  106767  164730                  MFPS    CCODES          ;STORE RESULTANT PSW
013746  042767  177400  164722          BIC     #177400,CCODES  ;CLEAR UNUSED BITS
013754  023767  000700  164714          CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALJE
013762  001401                          BEQ     64$             ;BR, IF EQUAL
013764  104001                          ERROR   1               ;***************TEST 51 - ERROR 1***************
                                                                ;PSW ERROR
                                                                ;EXPECTED PSW IS STORED AT "SAVR6"
                                                                ;ERRONEOUS SP VALUE IS AT "BADR6"
013766                          64$:
013766  005700                          TST     R0              ;CHECK R0=0
013770  001401                          BEQ     65$
013772  104002                          ERROR   2               ;***************TEST 51 - ERROR 2***************
                                                                ;R0 SHOULD BE ZERO
013774  005701                  65$:    TST     R1              ;CHECK R1=0
013776  001401                          BEQ     66$
014000  104003                          ERROR   3               ;***************TEST 51 - ERROR 3***************
                                                                ;R1 SHOULD BE ZERO
014002  020227  077777          66$:    CMP     R2,#077777      ;CHECK UPPER WORD OF ANSWER
014006  001401                          BEQ     67$             ;BR IF OK
014010  104004                          ERROR   4               ;***************TEST 51 - ERROR 4***************
                                                                ;UPPER WORD OF ANSWER IS IN ERROR
                                                                ;EXPECTED VALUE IS 077777
                                                                ;ERRONEOUS ANSWER VALUE IS IN R2
014012  020327  177777          67$:    CMP     R3,#177777      ;CHECK LOWER WORD OF ANSWER
014016  001401                          BEQ     68$             ;BR IF OK
014020  104005                          ERROR   5               ;***************TEST 51 - ERROR 5***************
                                                                ;LOWER WORD OF ANSWER IS IN ERROR
                                                                ;EXPECTED VALUE IS 177777
                                                                ;ERRORNEOUS ANSWER IS IN R3
014022  020467  164626          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
014026  001401                          BEQ     69$
014030  104006                          ERROR   6               ;***************TEST 51 - ERROR 6***************
                                                                ;R4 CHANGED
                                                                ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
014032  020567  164620          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
014036  001401                          BEQ     70$             ;BR IF OK
```

```
                        TS1     TEST "CVTNL" WITH SRC = -2,147,483,649, OVERFLOW                        SEQ 0104

4087  014040  104007                ERROR   7               ;***************TEST 51 - ERROR 7***************
4088                                                        ;R5 CHANGED
4089                                                        ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAC"
4090  014042                  70$:
4091  014042  000435            BR      TST52           ;BR TO NEXT TEST
4092  014044                  ST51:                       ;SOURCE STRING
4093  014044     062              .BYTE   62              ;MOST SIGNIFICANT DIGIT
4094  014045     061              .BYTE   61
4095  014046     064              .BYTE   64
4096  014047     067              .BYTE   67
4097  014050     064              .BYTE   64
4098  014051     070              .BYTE   70
4099  014052     063              .BYTE   63
4100  014053     066              .BYTE   66
4101  014054     064              .BYTE   64
4102  014055     171              .BYTE   171
4103
```

```
                                ;;*****************************************************************
                                ;*TEST 52       TEST "CVTNL" WITH SRC LENGTH = 1, SOURCE= 50,60
                                ;;*****************************************************************
014056  000004                TST52:  SCOPE
014060  004567  000646                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
014064  000002                        2                       ;SOURCE LENGTH
014066  014220                        ST52                    ;SOURCE ADDRESS
014070  177777                        177777                  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
014072  177777                        177777
014074  000377                        377                     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
014076  004567  000742                JSR     R5,XPSW
014102  000204                        .WORD   204
014104  004767  000650                JSR     PC,GENR         ;SET UP GENERAL REGISTERS
014110  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S
014112  000244                        CLZ

014114  076053                        CVTNL

014116  106767  164554                MFPS    CCODES          ;STORE RESULTANT PSW
014122  042767  177400  164546        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
014130  023767  000700  164540        CMP     @#EXPPSW.CCODES ;CHECK PSW AGAINST EXPECTED VALUE
014136  001401                        BEQ     64$             ;BR, IF EQUAL
014140  104001                        ERROR   1               ;***************TEST 52 - ERROR 1***************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
014142                          64$:
014142  005700                        TST     R0              ;CHECK R0=0
014144  001401                        BEQ     65$
014146  104002                        ERROR   2               ;***************TEST 52 - ERROR 2***************
                                                            ;R0 SHOULD BE ZERO
014150  005701                  65$:  TST     R1              ;CHECK R1=0
014152  001401                        BEQ     66$
014154  104003                        ERROR   3               ;***************TEST 52 - ERROR 3***************
                                                            ;R1 SHOULD BE ZERO
014156  020227  000000          66$:  CMP     R2,#0   ;CHECK UPPER WORD OF ANSWER
014162  001401                        BEQ     67$             ;BR IF OK
014164  104004                        ERROR   4               ;***************TEST 52 - ERROR 4***************
                                                            ;UPPER WORD OF ANSWER IS IN ERROR
                                                            ;EXPECTED VALUE IS 0
                                                            ;ERRONEOUS ANSWER VALUE IS IN R2
014166  020327  000000          67$:  CMP     R3,#0   ;CHECK LOWER WORD OF ANSWER
014172  001401                        BEQ     68$             ;BR IF OK
014174  104005                        ERROR   5               ;***************TEST 52 - ERROR 5***************
                                                            ;LOWER WORD OF ANSWER IS IN ERROR
                                                            ;EXPECTED VALUE IS 0
                                                            ;ERRORNEOUS ANSWER IS IN R3
014176  020467  164452          68$:  CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
014202  001401                        BEQ     69$
014204  104006                        ERROR   6               ;***************TEST 52 - ERROR 6***************
                                                            ;R4 CHANGED
                                                            ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
014206  020567  164444          69$:  CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
014212  001401                        BEQ     70$             ;BR IF OK
```

```
                        TS2     TEST "CVTNL" WITH SRC LENGTH = 1, SOURCE= 60,60                 SEQ 0108

4160  014214  104007                ERROR   7               ;****************TEST 52 - ERROR 7***************
4161                                                        ;R5 CHANGED
4162                                                        ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
4163  014216                  70$:
4164  014216  000401                BR      TST53           ;BR TO NEXT TEST
4165  014220                  ST52:                         ;SOURCE STRING
4166  014220     060                .BYTE   60              ;MOST SIGNIFICANT DIGIT
4167  014221     060                .BYTE   60
4168
```

```
                                        ;;*****************************************************************
                                        ;*TEST 53       TEST INTERRUPTABILITY OF "CVTNL"
                                        ;;*****************************************************************
014222  000004                        TST53:  SCOPE
014224  105777  164310                        TSTB    @SWR            ;TEST BIT 7 OF SWR
014230  100532                        BMI     $EOP            ;SKIP TO NEXT TEST IF SET
014232  026767  164312  164424        CMP     $TPS,TCSR       ;IS SLU USED FOR INTERRUPTS THE CONSOLE?
014240  001007                        BNE     CVTCONT         ;BR, IF NOT & PERFORM INTERRUPTABILITY TEST
014242  032767  000001  164336        BIT     #BIT0,$ENV      ;IF YES, IS PROGRAM UNDER APT?
014250  001403                        BEQ     CVTCONT         ;BR, IF NOT
014252  005767  164316                TST     $PASS           ;IF YES,CHECK IF NOT ON FIRST PASS
014256  001117                        BNE     $EOP            ;IF NOT, BR & SKIP TEST
014260                          CVTCONT:
014260  004567  000446                JSR     R5,NPREP        ;PREPARE ARGUMENTS FOR INSTRUCTION TEST
014264  000012                        12                      ;SOURCE LENGTH
014266  014472                        ST53                    ;SOURCE ADDRESS
014270  177777                        177777                  ;STORE ALL ONES TO LOAD INTO R2 & R3 REGISTERS
014272  177777                        177777
014274  000377                        377                     ;STORE A NON-ZERO VALUE TO TEST R4 UNAFFECTED BY "CVTZL"
014276  012767  014356  164370        MOV     #CVTPC,PCI      ;STORE PC OF TEST INSTRUCTION
014304  012777  015114  164356        MOV     #INTR,@TVECT    ;POINT TTY VECTOR TO INTERRUPT ROUTINE
014312  005077  164354                CLR     @TPSW           ;ALLOW INTERRUPTS AFTER TTY INTERRUPT
014316  004767  000546                JSR     PC,TDONE        ;WAIT FOR SLU READY
014322  013777  000554  164336        MOV     @#$NULL,@TBUF   ;SEND NULL CHARACTER
014330  004567  000510                JSR     R5,XPSW         ;STORE EXPECTED PSW
014334  000000                        .WORD   0
014336  106427  000000                MTPS    #0              ;ALLOW INTERRUPTS
014342  052777  000100  164314        BIS     #100,@TCSR      ;ENABLE TTY INTERRUPTS
014350  004767  000404          RECVTN: JSR     PC,GENR         ;SET UP GENERAL REGISTERS
014354  000277                        SCC                     ;SET UP THE COMPLEMENT OF EXPECTED CC'S

014356  076053                  CVTPC:  CVTNL

014360  106767  164312                MFPS    CCODES          ;STORE RESULTANT PSW
014364  032777  000100  164272        BIT     #100,@TCSR      ;IF INTERRUPTS ARE DISABLED, INSTRUCTION WAS INTERRUPTED
014372  001366                        BNE     RECVTN          ;BR & DO TEST AGAIN, IF INSTRUCTION WAS NOT INTERRUPTED
014374  042767  177400  164274        BIC     #177400,CCODES  ;CLEAR UNUSED BITS
014402  023767  000700  164266        CMP     @#EXPPSW,CCODES ;CHECK PSW AGAINST EXPECTED VALUE
014410  001401                        BEQ     64$             ;BR, IF EQUAL
014412  104001                        ERROR   1               ;****************TEST 53 - ERROR 1****************
                                                            ;PSW ERROR
                                                            ;EXPECTED PSW IS STORED AT "SAVR6"
                                                            ;ERRONEOUS SP VALUE IS AT "BADR6"
014414                          64$:
014414  005700                        TST     R0              ;CHECK R0=0
014416  001401                        BEQ     65$
014420  104002                        ERROR   2               ;****************TEST 53 - ERROR 2****************
                                                            ;R0 SHOULD BE ZERO
014422  005701                  65$:  TST     R1              ;CHECK R1=0
014424  001401                        BEQ     66$
014426  104003                        ERROR   3               ;****************TEST 53 - ERROR 3****************
                                                            ;R1 SHOULD BE ZERO
014430  020227  052525          66$:  CMP     R2,#052525      ;CHECK UPPER WORD OF ANSWER
014434  001401                        BEQ     67$             ;BR IF OK
014436  104004                        ERROR   4               ;****************TEST 53 - ERROR 4****************
```

```
4225                                                    ;UPPER WORD OF ANSWER IS IN ERROR
4226                                                    ;EXPECTED VALUE IS 052525
4227                                                    ;ERRONEOUS ANSWER VALUE IS IN R2
4228  014440  020327  125252          67$:    CMP     R3,#125252      ;CHECK LOWER WORD OF ANSWER
4229  014444  001401                          BEQ     68$             ;BR IF OK
4230  014446  104005                          ERROR   5               ;***************TEST 53 - ERROR 5***************
4231                                                    ;LOWER WORD OF ANSWER IS IN ERROR
4232                                                    ;EXPECTED VALUE IS 125252
4233                                                    ;ERRORNEOUS ANSWER IS IN R3
4234  014450  020467  164200          68$:    CMP     R4,DSTLN        ;CHECK R4 UNCHANGED
4235  014454  001401                          BEQ     69$
4236  014456  104006                          ERROR   6               ;***************TEST 53 - ERROR 6***************
4237                                                    ;R4 CHANGED
4238                                                    ;R4 SHOULD STILL EQUAL TH CONTENTS OF "FILL"
4239  014460  020567  164172          69$:    CMP     R5,DSTAD        ;CHECK R5 UNCHANGED
4240  014464  001401                          BEQ     70$             ;BR IF OK
4241  014466  104007                          ERROR   7               ;***************TEST 53 - ERROR 7***************
4242                                                    ;R5 CHANGED
4243                                                    ;R5 SHOULD STILL EQUAL THE CONTENTS OF "DSTAD"
4244  014470                          70$:
4245  014470  000405                          BR      ENDT53          ;BR TO END OF THIS TEST
4246  014472                          ST53:                           ;SOURCE STRING
4247  014472     061                          .BYTE   61              ;MOST SIGNIFICANT DIGIT
4248  014473     064                          .BYTE   64
4249  014474     063                          .BYTE   63
4250  014475     061                          .BYTE   61
4251  014476     066                          .BYTE   66
4252  014477     067                          .BYTE   67
4253  014500     067                          .BYTE   67
4254  014501     066                          .BYTE   66
4255  014502     061                          .BYTE   61
4256  014503     060                          .BYTE   60
4257
4258  014504  016777  164162  164156  ENDT53: MOV     TPSW,@TVECT
4259  014512  106427  000200                  MTPS    #200
4260
```

```
                                        .SBTTL  END OF PASS ROUTINE

                                        ;;**********************************************************************
                                        ;*INCREMENT THE PASS NUMBER ($PASS)
                                        ;*IF SW12=1 INHIBIT TRACE TRAP
                                        ;*IF THERES A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO BEGIN

014516                                  $EOP:
014516  000004                                  SCOPE
014520  005067  163756                          CLR     $TSTNM          ;;ZERO THE TEST NUMBER
014524  005267  164044                          INC     $PASS           ;;INCREMENT THE PASS NUMBER
014530  042767  100000  164036                  BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
014536  005327                                  DEC     (PC)+           ;;LOOP?
014540  000001                          $EOPCT: .WORD   1
014542  003024                                  BGT     $DOAGN          ;;YES
014544  012737                                  MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
014546  000001                          $ENDCT: .WORD   1
014550  014540                                  $EOPCT
014552  104401  014664                          TYPE,   ENDMSG          ;TYPE "END PASS"
014556  013700  000042                  $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
014562  001414                                  BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
014564  005046                                  CLR     -(SP)           ;;INSURE THE "T" BIT IS CLEAR
014566  012746  014574                          MOV     #$CLR.T,-(SP)   ;;SETUP FOR AN RTI OR RTT
014572  000426                                  BR      $RTRN           ;;GO DO AN RTI OR RTT TO LOAD THE PSW
                                                                        ;;WITH A CLEARED "T" BIT
014574                                  $CLR.T:
014574  013700  000042                          MOV     @#42,R0         ;;INSURE R0 CONTAINS THE MONITORS
014600  001405                                  BEQ     $DOAGN          ;;RETURN ADDRESS
014602  000005                                  RESET                   ;;CLEAR THE WORLD
014604  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
014606  000240                                  NOP                     ;;SAVE ROOM
014610  000240                                  NOP                     ;;FOR
014612  000240                                  NOP                     ;;ACT11
014614                                  $DOAGN:
014614  104400                                  TRAP                    ;;PUSH OLD PSW AND PC ON STACK
014616  042716  000020                          BIC     #20,(SP)        ;;CLEAR THE "T" BIT
014622  032777  010000  163710                  BIT     #BIT12,@SWR     ;;RUN WITH TRACE TRAP?
014630  001005                                  BNE     1$              ;;BR IF NO
014632  005167  000020                          COM     $TBIT           ;;IS IT TIME FOR TRACE TRAP
014636  100402                                  BMI     1$              ;;BR IF NO
014640  052716  000020                          BIS     #20,(SP)        ;;SET TRACE TRAP
014644  012746  014652                  1$:     MOV     #$LOOP,-(SP)    ;;JUMP TO START OF TEST
014650  000002                          $RTRN:  RTI                     ;;RETURN--THIS IS CHANGED TO
                                                                        ;;AN "RTT" IF "RTT" IS A LEGAL
                                                                        ;;INSTRUCTION
014652                                  $LOOP:
014652  000137                                  JMP     @(PC)+          ;;RETURN
014654  001300                          $RTNAD: .WORD   BEGIN
014656  000000                          $TBIT:  .WORD   0               ;;"T" BIT STATE INDICATOR
014660     377     377     000          $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
                014664                          .EVEN
014664  005015  047105  020104          ENDMSG: .ASCIZ  <15><12>/END PASS  /
014672  040520  051523  020040
```

```
 4317  014700     000
 4318           014702                        .EVEN
 4319
```

```
                                ;ROUTINE TO REPORT UNEXPECTED TRAPS TO LOCATION 0
000706  014702  011637  000706  TZERO:  MOV     (SP),@#OLDPC    ;GET PC+2 WHERE UNEXPECTED  TRAP OCCURRED
000710  014706  104200          ERROR   200             ;**********ERROR 200**********
                                ;UNEXPECTED TRAP TO LOCATION 0
                                ;"OLDPC" CONTAINS THE PC+2 OF THE TRAP OCCURRENCE
000712  014710  000000          HALT                    ;PROGRAM MUST BE RESTARTED AT THIS POINT

                                ;ROUTINE TO REPORT UNEXPECTED TRAPS TO LOCATION 4
000716  014712  011637  000706  TIMTRP: MOV     (SP),@#OLDPC    ;GET PC+2 WHERE UNEXPECTED TIMEOUT TRAP OCCURRED
000720  014716  104204          ERROR   204             ;**********ERROR 204**********
                                ;UNEXPECTED TRAP TO LOCATION 4
                                ;"OLDPC" CONTAINS THE PC+2 OF THE TRAP OCCURRENCE
000722  014720  000000          HALT                    ;PROGRAM MUST BE RESTARTED AT THIS POINT

                                ;ROUTINE TO REPORT UNEXPECTED TRAPS TO LOCATION 10
000726  014722  011637  000706  ILLTRP: MOV     (SP),@#OLDPC    ;GET PC+2 WHERE UNEXPECTED ILLEGAL INSTRUCTION TRAP OCCU
000730  014726  104210          ERROR   210             ;**********ERROR 210**********
                                ;UNEXPECTED TRAP TO LOCATION 10
                                ;"OLDPC" CONTAINS THE PC+2 OF THE TRAP OCCURRENCE
000732  014730  000000          HALT                    ;PROGRAM MUST BE RESTARTED AT THIS POINT


                                ;SUBROUTINE TO SET OPERAND VALUES

000734  014732  012567  163706  NPREP:  MOV     (R5)+,S1LN      ;STORE INSTRUCTION TEST ARGUMENTS
000740  014736  012567  163704          MOV     (R5)+,S1ADR
000744  014742  012567  163702          MOV     (R5)+,S2LN
000750  014746  012567  163700          MOV     (R5)+,S2ADR
000754  014752  012567  163676          MOV     (R5)+,DSTLN
000760  014756  000205                  RTS     R5


                                ;SUBROUTINE TO SET UP GENERAL REGISTERS

000762  014760  016700  163660  GENR:   MOV     S1LN,R0         ;TRANSFER INSTRUCTION TEST ARGUMENTS TO
000766  014764  016701  163656          MOV     S1ADR,R1        ;    THE GENERAL REGISTERS
000772  014770  016702  163654          MOV     S2LN,R2
000776  014774  016703  163652          MOV     S2ADR,R3
001002  015000  016704  163650          MOV     DSTLN,R4
001006  015004  016705  163646          MOV     DSTAD,R5
001012  015010  010637  000702          MOV     SP,@#SAVRE      ;COPY STACK POINTER BEFORE INSTRUCTION EXECUTION
001016  015014  062737  000002  000702  ADD     #2,@#SAVRE      ;ADJUST SAVED SP BECAUSE OF JSR TO THIS ROUTINE
001024  015022  000207          RTS     PC
```

G09


```
                                        ;SUBROUTINE TO CLEAR BUFFER AREA
015024  012700  017000                  CLBUF:  MOV     #BUF,R0         ;POINT R0 TO BUFFER AREA
015030  012701  000020                          MOV     #20,R1          ;STORE BUFFER LENGTH IN R1
015034  005020                          1$:     CLR     (R0)+           ;CLEAR BUFFER
015036  005301                                  DEC     R1              ;DECREMENT BUFFER LENGTH
015040  001375                                  BNE     1$              ;BR IF NOT FINISHED
015042  000207                                  RTS     PC              ;RETURN

                                        ;SUBROUTINE TO RECORD EXPECTED PSW
015044  012537  000700                  XPSW:   MOV     (R5)+,@#EXPPSW  ;STORE EXPECTED PSW VALUE IN "EXPPSW"
015050  106700                                  MFPS    R0              ;GET PRESENT PSW
015052  032700  000020                          BIT     #TBIT,R0        ;IS T-BIT SET?
015056  001403                                  BEQ     1$              ;BR IF NOT
015060  052737  000020  000700                  BIS     #TBIT,@#EXPPSW  ;OTHERWISE SET T-BIT IN EXPECTED PSW VALUE
015066  000205                          1$:     RTS     R5              ;RETURN




                                                ;SUBROUTINE TO TEST FOR TRANSMIT DONE FLAG
015070  005077  163614                  TDONE:  CLR     @TEMP           ;CLEAR TIMER
015074  105777  163564                  1$:     TSTB    @TCSR           ;IS SLU READY?
015100  100404                                  BMI     RETN            ;BR IF READY
015102  005277  163602                          INC     @TEMP           ;OTHERWISE INCREMENT TIMER
015106  001372                                  BNE     1$              ;BR IF NOT TIMED OUT
015110  104300                                  ERROR   300             ;***************ERROR 300***************
                                                                        ;NEVER GOT TRANSMIT DONE FLAG
015112  000207                          RETN:   RTS     PC              ;RETURN


                                                ;SUBROUTINE TO HANDLE TTY INTERRUPTS IN INSTRUCTION
                                                ;INTERRUPTABILITY TESTS

015114                                  INTR:
015114  021667  163554                          CMP     (SP),PCI        ;WAS PC AT INSTRUCTION UNDER TEST?
015120  001003                                  BNE     SEND            ;BR, IF NO
015122  032704  177400                  CKR4:   BIT     #177400,R4      ;IF YES, CHECK UPPER BYTE OF R4
015126  001004                                  BNE     CLRINT          ;IF ZERO, INSTRUCTION WAS NOT INTERRUPTED-TRY AGAIN
015130  013777  000554  163530          SEND:   MOV     @#$NULL,@TBUF   ;SEND ANOTHER CHARACTER
015136  000002                                  RTI                     ;RETURN
015140  042777  000100  163516          CLRINT: BIC     #100,@TCSR      ;IF NON-ZERO, CLEAR INTERRUPT ENABLE
015146  000002                                  RTI                     ;CONTINUE INSTRUCTION
```

```
                                        .SBTTL  SCOPE HANDLER ROUTINE

                                        ;;*****************************************************************
                                        ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                        ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                        ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                        ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                        ;*SW14=1         LOOP ON TEST
                                        ;*SW09=1         LOOP ON ERROR
                                        ;*SW08=1         LOOP ON TEST IN SWR<5:0>
                                        ;*CALL
                                        ;*      SCOPE           ;;SCOPE=IOT

015150                                  $SCOPE:
015150  032777  040000  163362  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
015156  001065                          BNE     $OVER           ;;YES IF SW14=1
                                        ;*****START OF CODE FOR THE XOR TESTER*****
015160  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
015162  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
015166  012737  015206  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
015174  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
015200  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
015204  000434                          BR      $SVLAD          ;;GO TO THE NEXT TEST
015206  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
015210  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
015214  000422                          BR      7$              ;;LOOP ON THE PRESENT TEST
015216                          6$::*****END OF CODE FOR THE XOR TESTER*****
015216  032777  000400  163314          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
015224  001407                          BEQ     2$              ;;BR IF NO
015226  017746  163306                  MOV     @SWR,-(SP)      ;;SET DESIRED TEST NUM. FROM SWR
015232  042716  000300                  BIC     #$SWRMK,(SP)    ;;STRIP AWAY UNDESIRED BITS
015236  122667  163240                  CMPB    (SP)+,$TSTNM    ;;ON THE RIGHT TEST?
015242  001433                          BEQ     $OVER           ;;BR IF YES
015244  105767  163233          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
015250  001412                          BEQ     $SVLAD          ;;BR IF NO
015252  032777  001000  163260          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
015260  001404                          BEQ     4$              ;;BR IF NO
015262  016767  163222  163216  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
015270  000420                          BR      $OVER
015272  105067  163205          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
015276  105267  163200          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
015302  116767  163174  163262          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
015310  011667  163172                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
015314  011667  163170                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
015320  005067  163234                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
015324  112767  000001  163163          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
015332  016777  163144  163202  $OVER:  MOV     $TSTNM,@DISP_AY ;;DISPLAY TEST NUMBER
015340  016716  163142                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
015344  000002                          RTI                     ;;FIXES PS
```

```
                                        .SBTTL  POWER DOWN AND UP ROUTINES
                                        ;;*****************************************************************
                                        ;POWER DOWN ROUTINE
015346  012737  015530  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
015354  012737  000340  000026          MOV     #340,@#PWRVEC+2  ;;PRIO:7
015362  010046                          MOV     R0,-(SP)         ;;PUSH R0 ON STACK
015364  010146                          MOV     R1,-(SP)         ;;PUSH R1 ON STACK
015366  010246                          MOV     R2,-(SP)         ;;PUSH R2 ON STACK
015370  010346                          MOV     R3,-(SP)         ;;PUSH R3 ON STACK
015372  010446                          MOV     R4,-(SP)         ;;PUSH R4 ON STACK
015374  010546                          MOV     R5,-(SP)         ;;PUSH R5 ON STACK
015376  017746  163136                  MOV     @SWR,-(SP)       ;;PUSH @SWR ON STACK
015402  010667  000126                  MOV     SP,$SAVR6        ;;SAVE SP
015406  012737  015420  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
015414  000000                          HALT
015416  000776                          BR      .-2              ;;HANG UP
                                        ;;*****************************************************************
                                        ;POWER UP ROUTINE
015420  012737  015530  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
015426  016706  000102                  MOV     $SAVR6,SP        ;;GET SP
015432  005067  000076                  CLR     $SAVR6           ;;WAIT LOOP FOR THE TTY
015436  005267  000072          1$:     INC     $SAVR6           ;;WAIT FOR THE INC
015442  001375                          BNE     1$               ;;OF  WORD
015444  005067  163032                  CLR     $TSTNM
015450  012677  163064                  MOV     (SP)+,@SWR       ;;POP STACK INTO @SWR
015454  012605                          MOV     (SP)+,R5         ;;POP STACK INTO R5
015456  012604                          MOV     (SP)+,R4         ;;POP STACK INTO R4
015460  012603                          MOV     (SP)+,R3         ;;POP STACK INTO R3
015462  012602                          MOV     (SP)+,R2         ;;POP STACK INTO R2
015464  012601                          MOV     (SP)+,R1         ;;POP STACK INTO R1
015466  012600                          MOV     (SP)+,R0         ;;POP STACK INTO R0
015470  012737  015346  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
015476  012737  000340  000026          MOV     #340,@#PWRVEC+2  ;;PRIO:7
015504  104401                          TYPE                     ;REPORT THE POWER FAILURE
015506  015536                  $PWRMG: .WORD   $POWER           ;;POWER FAIL MESSAGE POINTER
015510  012716                          MOV     (PC)+,(SP)       ;;RESTART AT $LOOP
015512  014652                  $PWRAD: .WORD   $LOOP            ;;RESTART ADDRESS
015514  042766  000020  000002          BIC     #20,2(SP)        ;;CLEAR "T" BIT
015522  005067  177130                  CLR     $TBIT            ;;CLEAR THE "T" BIT FLAG
015526  000002                          RTI
015530  000000                  $ILLUP: HALT                     ;;THE POWER UP SEQUENCE WAS STARTED
015532  000776                          BR      .-2              ;; BEFORE THE POWER DOWN WAS COMPLETE
015534  000000                  $SAVR6: 0                        ;;PUT THE SP HERE
015536  005015  047520  042527  $POWER: .ASCIZ  <15><12>"POWER"
015544  000122
                                        .EVEN
```

```
                                .SBTTL  ERROR HANDLER ROUTINE

                                ;;*****************************************************************
                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT.
                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
                                ;*AND TYPE OUT THE PC OF THE ERROR INSTRUCTION
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW15=1         HALT ON ERROR
                                ;*SW13=1         INHIBIT ERROR TYPEOUTS
                                ;*SW09=1         LOOP ON ERROR
                                ;*CALL
                                ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER

015546                          $ERROR:
015546  105267  162731          7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
015552  001775                          BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
015554  016777  162722  162760          MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
015562  005267  162724                  INC     $ERTTL          ;;INC THE ERROR COUNT
015566  011667  162724                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
015572  162767  000002  162716          SUB     #2,$ERRPC
015600  117767  162712  162706          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
015606  032777  020000  162724          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
015614  001007                          BNE     20$             ;;SKIP TYPEOUTS
015616  104401  000563                  TYPE    ,$CRLF
015622  016746  162670                  MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
                                                                ;;ERROR ADDRESS
015626  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
015630  104401  000563                  TYPE    ,$CRLF
015634                          20$:
015634  122767  000001  162744          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
015642  001007                          BNE     2$              ;;NO,SKIP APT ERROR REPORT
015644  116767  162644  000004          MOVB    $ITEMB,21$      ;;SET ITEM NUMBER AS ERROR NUMBER
015652  004767  000604                  JSR     PC,$ATY4        ;;REPORT FATAL ERROR TO APT
015656     000          21$:    .BYTE   0
015657     000                  .BYTE   0
015660  000777          22$:    BR      22$             ;;APT ERROR LOOP
015662  005777  162652  2$:     TST     @SWR            ;;HALT ON ERROR
015666  100001                  BPL     3$              ;;SKIP IF CONTINUE
015670  000000                  HALT                    ;;HALT ON ERROR!
015672  032777  001000  162640  3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
015700  001402                  BEQ     4$              ;;BR IF NO
015702  016716  162602                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
015706  005767  162646          4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
015712  001402                  BEQ     5$              ;;BR IF NONE
015714  016716  162640                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
015720                          5$:
015720  022737  014604  000042          CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
015726  001001                          BNE     6$              ;;BRANCH IF NO
015730  000000                          HALT                    ;;YES
015732                          6$:
015732  000002                  RTI                     ;;RETURN
```

```
                                        .SBTTL  TYPE ROUTINE

                                        ;;**********************************************************************
                                        ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                        ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                        ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                        ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                        ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                        ;*
                                        ;*CALL:
                                        ;*1) USING A TRAP INSTRUCTION
                                        ;*       TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                        ;*OR
                                        ;*       TYPE
                                        ;*       MESADR
                                        ;*

015734  105767  162617          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
015740  100002                          BPL     1$              ;;BR IF YES
015742  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
015744  000430                          BR      3$              ;;LEAVE
015746  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
015750  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
015754  122767  000001  162624          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
015762  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
015764  132767  000100  162615          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
015772  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
015774  010067  000004                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
016000  004767  000446                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
016004  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
016006  132767  000040  162573  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
016014  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
016016  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
016020  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
016022  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
016024  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
016026  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
016032  000002                          RTI                     ;;RETURN
016034  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
016040  001430                          BEQ     8$
016042  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
016046  001006                          BNE     5$
016050  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
016052  104401                          TYPE                    ;;TYPE A CR AND LF
016054  000563                          $CRLF
016056  105067  000130                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
016062  000755                          BR      2$              ;;GET NEXT CHARACTER
016064  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
016070  126726  162462          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
016074  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
016076  016746  162452                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
016102  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
016106  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
016110  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
```

```
 4624  016114  105367  000072            DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
 4625  016120  000770                    BR      7$              ;;LOOP
 4626
 4627                                  ;HORIZONTAL TAB PROCESSOR
 4628
 4629  016122  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
 4630  016126  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
 4631  016132  132767  000007  000052          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
 4632  016140  001372                          BNE     9$              ;;TAB STOP
 4633  016142  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
 4634  016144  000724                          BR      2$              ;;GET NEXT CHARACTER
 4635  016146  105777  162376          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
 4636  016152  100375                          BPL     $TYPEC
 4637  016154  116677  000002  162370        MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 4638  016162  122766  000015  000002        CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
 4639  016170  001003                        BNE     1$              ;;BRANCH IF NO
 4640  016172  105067  000014                CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
 4641  016176  000406                        BR      $TYPEX          ;;EXIT
 4642  016200  122766  000012  000002  1$:   CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
 4643  016206  001402                        BEQ     $TYPEX          ;;BRANCH IF YES
 4644  016210  105227                        INCB    (PC)+           ;;COUNT THE CHARACTER
 4645  016212  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
 4646  016214  000207          $TYPEX: RTS     PC
 4647
```

```
                                .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE

                                ;;*****************************************************************
                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                ;*      .BYTE   M               ;;M=1 OR 0
                                ;*                                      ;;1=TYPE LEADING ZEROS
                                ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                ;*
                                ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                ;*$TYPOS OR $TYPOC
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPON                   ;;CALL FOR TYPEOUT
                                ;*
                                ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOC                   ;;CALL FOR TYPEOUT

016216  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
016222  116667  000001  000211          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
016230  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
016234  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
016240  000406                          BR      $TYPON
016242  112767  000001  000171  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
016250  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
016256  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
016264  010346                          MOV     R3,-(SP)        ;;SAVE R3
016266  010446                          MOV     R4,-(SP)        ;;SAVE R4
016270  010546                          MOV     R5,-(SP)        ;;SAVE R5
016272  116704  000145                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
016276  005404                          NEG     R4
016300  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
016304  110467  000132                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
016310  116704  000125                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
016314  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
016320  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
016322  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
016324  000404                          BR      3$              ;;GO DO MSB
016326  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
016330  006105                          ROL     R5
016332  006105                          ROL     R5
016334  010503                          MOV     R5,R3
016336  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
016340  105367  000076                  DECB    $OMODE          ;;TYPE THIS DIGIT?
016344  100016                          BPL     7$              ;;BR IF NO
016346  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
016352  001002                          BNE     4$              ;;TEST FOR 0
016354  005704                          TST     R4              ;;SUPPRESS THIS 0?
```

```
 4704  016356  001403                        BEQ     5$              ;;BR IF YES
 4705  016360  005204                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
 4706  016362  052703  000060                BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
 4707  016366  052703  000040        5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
 4708  016372  110367  000040                MOVB    R3,8$           ;;SAVE FOR TYPING
 4709  016376  104401  016436                TYPE    ,8$             ;;GO TYPE THIS DIGIT
 4710  016402  105367  000032        7$:     DECB    $OCNT           ;;COUNT BY 1
 4711  016406  003347                        BGT     2$              ;;BR IF MORE TO DO
 4712  016410  002402                        BLT     6$              ;;BR IF DONE
 4713  016412  005204                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
 4714  016414  000744                        BR      2$              ;;GO DO THE LAST DIGIT
 4715  016416  012605                6$:     MOV     (SP)+,R5        ;;RESTORE R5
 4716  016420  012604                        MOV     (SP)+,R4        ;;RESTORE R4
 4717  016422  012603                        MOV     (SP)+,R3        ;;RESTORE R3
 4718  016424  016666  000002  000004        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
 4719  016432  012616                        MOV     (SP)+,(SP)
 4720  016434  000002                        RTI                     ;;RETURN
 4721  016436     000                8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
 4722  016437     000                        .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
 4723  016440     000                $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
 4724  016441     000                $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
 4725  016442  000000                $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
```

```
 4726
 4727                                   .SBTTL  APT COMMUNICATIONS ROUTINE
 4728
 4729                                   ;;*****************************************************************
 4730  016444  112767  000001  000236  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
 4731  016452  112767  000001  000226  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
 4732  016460  000403                         BR      $ATYC
 4733  016462  112767  000001  000220  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
 4734  016470                         $ATYC:
 4735  016470  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 4736  016472  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 4737  016474  105767  000206                 TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
 4738  016500  001450                         BEQ     5$              ;;IF NOT:  BR
 4739  016502  122767  000001  162076         CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
 4740  016510  001031                         BNE     3$              ;;IF NOT:  BR
 4741  016512  132767  000100  162067         BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
 4742  016520  001425                         BEQ     3$              ;;IF NOT:  BR
 4743  016522  017600  000004                 MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
 4744  016526  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 4745  016534  005767  162026          1$:    TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
 4746  016540  001375                         BNE     1$              ;;IF NOT:  WAIT
 4747  016542  010067  162034                 MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
 4748  016546  105720                  2$:    TSTB    (R0)+           ;;FIND END OF MESSAGE
 4749  016550  001376                         BNE     2$
 4750  016552  166700  162024                 SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
 4751  016556  006200                         ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
 4752  016560  010067  162020                 MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
 4753  016564  012767  000004  161774         MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
 4754  016572  000413                         BR      5$
 4755  016574  017667  000004  000016  3$:    MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
 4756  016602  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
 4757  016610  016746  161162                 MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
 4758  016614  004767  177114                 JSR     PC,$TYPE        ;;CALL TYPE MACRO
 4759  016620  000000                  4$:    .WORD   0
 4760  016622                           5$:
 4761  016622  105767  000062          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
 4762  016626  001416                         BEQ     12$             ;;IF NOT:  BR
 4763  016630  005767  161752                 TST     $ENV            ;;RUNNING UNDER APT?
 4764  016634  001413                         BEQ     12$             ;;IF NOT:  BR
 4765  016636  005767  161724          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
 4766  016642  001375                         BNE     11$             ;;IF NOT:  WAIT
 4767  016644  017667  000004  161716         MOV     @4(SP),$FATAL   ;;GET ERROR #
 4768  016652  062766  000002  000004         ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
 4769  016660  005267  161702                 INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
 4770  016664  105067  000020          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
 4771  016670  105067  000013                 CLRB    $LFLG           ;;CLEAR LOG FLAG
 4772  016674  105067  000006                 CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
 4773  016700  012601                         MOV     (SP)+,R1        ;;POP STACK INTO R1
 4774  016702  012600                         MOV     (SP)+,R0        ;;POP STACK INTO R0
 4775  016704  000207                         RTS     PC              ;;RETURN
 4776  016706     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
 4777  016707     000          $LFLG:  .BYTE   0               ;;LOG FLAG
 4778  016710     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
 4779         016712                          .EVEN
 4780         000200                  APTSIZE=200
 4781         000001                  APTENV=001
```

```
4782          000100                   APTSPOOL=100
4783          000040                   APTCSUP=04C
```

```
                                        .SBTTL  TRAP DECODER
                                
                                        ;;**************************************************************
                                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
                                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                        ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                        ;*GO TO THAT ROUTINE.
                                
016712  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
016714  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
016720  005740                          TST     -(R0)           ;;BACKUP BY 2
016722  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
016724  006300                          ASL     R0              ;;POSITION FOR INDEXING
016726  016000  016746                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
016732  000200                          RTS     R0              ;;GO TO ROUTINE
                                
                                        ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
                                
016734  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
016736  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
016744  000002                          RTI                     ;;RESTORE THE PSW
                                
                                        .SBTTL  TRAP TABLE
                                
                                        ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                        ;*BY THE "TRAP" INSTRUCTION.
                                
                                        ;       ROUTINE
                                        ;       -------
016746  016734                  $TRPAD: .WORD   $TRAP2
016750  015734                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
016752  016242                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
016754  016216                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
016756  016256                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
                                
                                
016760  005015  042115  030455  NAME:   .ASCIZ  <15><12>/MD-11-DVKAJ-A/
016766  026461  053104  040513
016774  026512  000101
                                
017000  ******  ******          BUF:    .BLKW   20
                                        .END
```

```
ABASE = 177560           474*    590      631
ACDW1 = 000000C          590
ACDW2 = 000000           590
ACPLOP= 000000           590      605
ADDN  = 076050           463*    763      859      955     1051     1143     1211     1298     1387     1474     1553     1643     1711
                        1799    1888     1976     2063     2165
ADDNPC  006106          2154    2165*
ADDW0 = 000000           590
ADDW1 = 000000           590
ADDW10= 000000           590
ADDW11= 000000           590
ADDW12= 000000           590
ADDW13= 000000           590
ADDW14= 000000           590
ADDW15= 000000           590
ADDW2 = 000000           590
ADDW3 = 000000           590
ADDW4 = 000000           590
ADDW5 = 000000           590
ADDW6 = 000000           590
ADDW7 = 000000           590
ADDW8 = 000000           590
ADDW9 = 000000           590
ADEVCT= 000000           590      596
ADEVM = 000000           590
AENV  = 000000           590      601
AENVM = 000000           590      602
AFATAL= 000000           590      593
AMADR1= 000000           590      619
AMADR2= 000000           590      622
AMADR3= 000000           590      625
AMADR4= 000000           590      628
AMAMS1= 000000           590      612
AMAMS2= 000000           590      620
AMAMS3= 000000           590      623
AMAMS4= 000000           590      626
AMSGAD= 000000           590      598
AMSGLG= 000000           590      599
AMSGTY= 000000           590      592
AMTYP1= 000000           590      613
AMTYP2= 000000           590      621
AMTYP3= 000000           590      624
AMTYP4= 000000           590      627
ANS10   003636          1431    1451*
ANS11   004050          1518    1536*
ANS12   004262          1603    1621*
ANS14   004657          1755    1776*
ANS15   005075          1843    1864*
ANS16   005313          1932    1953*
ANS17   005530          2020    2040*
ANS20   005744          2107    2127*
ANS21   006270          2211    2233*
ANS22   006523          2305    2326*
ANS23   006737          2392    2413*
ANS24   007266          2498    2520*
ANS8    003204          1255    1275*
```

```
ANS7    003420          1342    1362*
APASS = 000000           590     595
APRIOR= 000000           590
APTCSU= 000040           466*    4599    4783*
APTENV= 000001           464*    4546    4592    4739    4781*
APTSIZ= 000200           463*     719    4780*
APTSPO= 000100           465*    4594    4741    4792*
ASWREG= 000000           590     603
ATESTN= 000000           590     594
AUNIT = 000000           590     597
AUSWR = 000000           590     604
AVECT1= 000060           475*    590     629
AVECT2= 000000           590     630
BADR6   000704           666*   1180*   1248*   1335*   1424*   1511*   1596*   1680*   1748*   1836*   1925*   2013*   2100*
                        2204*   2298*   2385*   2491*   2587*   2661*   2736*   2812*   2889*   2961*   3035*   3111*   3184*
                        3258*   3332*   3406*   3479*   3553*   3626*   3717*
BEGIN   001300           724     739*   4311
BIT0  = 000001           448*   2142    2428    3653    4178
BIT00 = 000001           438*    448
BIT01 = 000002           437*    447
BIT02 = 000004           436*    446
BIT03 = 000010           435*    445
BIT04 = 000020           434*    444
BIT05 = 000040           433*    443
BIT06 = 000100           432*    442
BIT07 = 000200           431*    441
BIT08 = 000400           430*    440    4445
BIT09 = 001000           429*    439    4453    4556
BIT1  = 000002           447*
BIT10 = 002000           428*
BIT11 = 004000           427*
BIT12 = 010000           426*   4300
BIT13 = 020000           425*   4538
BIT14 = 040000           424*   4431
BIT15 = 100000           423*
BIT2  = 000004           446*
BIT3  = 000010           445*
BIT4  = 000020           444*
BIT5  = 000040           443*
BIT6  = 000100           442*
BIT7  = 000200           441*
BIT8  = 000400           440*
BIT9  = 001000           439*
BPTVEC= 000014           455*
BUF     017000           655    4373    4827*
CCODES  000675           663*   1145*   1146*   1147    1213*   1214*   1215    1300*   1301*   1302    1389*   1390*   1391
                        1476*   1477*   1478    1561*   1562*   1563    1645*   1646*   1647    1713*   1714*   1715    1801*
                        1802*   1803    1890*   1891*   1892    1978*   1979*   1980    2065*   2066*   2067    2167*   2170*
                        2171    2263*   2264*   2265    2350*   2351*   2352    2454*   2457*   2458    2550*   2551*   2552
                        2624*   2625*   2626    2699*   2700*   2701    2775*   2776*   2777    2852*   2853*   2854    2924*
                        2925*   2926    2998*   2999*   3000    3074*   3075*   3076    3147*   3148*   3149    3221*   3222*
                        3223    3295*   3296*   3297    3369*   3370*   3371    3442*   3443*   3444    3516*   3517*   3518
                        3589*   3590*   3591    3678*   3681*   3682    3758*   3759*   3760    3832*   3833*   3834    3905*
                        3906*   3307    3978*   3979*   3980    4051*   4052*   4053    4124*   4125*   4126    4203*   4206*
                        4227
CKR4    015122          4408*
```

```
CLBUF   015024          753    849    945   1041   1137   1206   1292   1381   1468   1553   1637   1705   1793
                       1882   1970   2057   2153   2255   2343   2439   4373*
CLRINT  015140         4409   4412*
CMPN  = 076052          463*  2548   2622   2697   2773   2850   2922   2996   3072   3145   3219   3293   3367
                       3440   3514   3587   3676
CMPNPC  012656         3664   3676*
CR    = 000015          363*  4638   4648
CRLF  = 000200          364*  4609   4648
CVTCON  014260         4177   4179   4192*
CVTNL = 076053          463*  3756   3830   3903   3975   4049   4122   4201
CVTPC   014356         4189   4201*
DDISP = 177570          370*   573
DISPLA  000542          573*   716*  4464*  4533*
DISPRE  000174          487*   716
DSTAD   000656          655*   796    892    988   1084   1174   1242   1256   1329   1343   1418   1432   1505
                       1519   1590   1604   1674   1742   1756   1830   1844   1919   1933   2007   2021   2094
                       2108   2198   2212   2292   2306   2379   2393   2485   2499   2580   2654   2729   2805
                       2882   2954   3028   3104   3177   3251   3325   3399   3472   3546   3619   3710   3792
                       3866   3939   4012   4085   4158   4239   4365
DSTLN   000654          654*  1170   1238   1257   1325   1344   1414   1433   1501   1520   1586   1605   1670
                       1738   1757   1826   1845   1915   1934   2003   2022   2090   2109   2194   2213   2288
                       2307   2375   2394   2481   2500   2575   2649   2724   2800   2877   2949   3023   3099
                       3172   3246   3320   3394   3467   3541   3614   3705   3787   3861   3934   4007   4080
                       4153   4234   4354*  4364
DSWR  = 177570          369*   572
EMTVEC= 000030          458*   688*   689*
ENDMSG  014664         4282   4315*
ENDT1   001552          768    825    835*
ENDT2   002034          864    921    931*
ENDT21  006276         2222   2241*
ENDT24  007274         2509   2528*
ENDT3   002316          960   1017   1027*
ENDT4   002600         1056   1113   1123*
ENDT44  013012         3723   3736*
ENDT53  014504         4245   4258*
ERRVEC= 000004          451*  4436   4437*  4439*  4442*
EXPPSW  000700          664*   804    826    900    922    996   1018   1092   1114   1147   1215   1302   1391
                       1478   1563   1647   1715   1803   1892   1980   2067   2171   2265   2352   2458   2553
                       2626   2701   2777   2854   2926   3000   3076   3149   3223   3297   3371   3444   3518
                       3591   3682   3760   3834   3907   3980   4053   4126   4207   4381*  4385*
FILL    000660          656*   791    887    983   1079
GENR    014760          760    856    952   1046   1140   1209   1295   1384   1471   1556   1640   1708   1796
                       1885   1973   2060   2163   2258   2346   2449   2544   2618   2694   2769   2846   2918
                       2992   3068   3142   3215   3289   3363   3437   3511   3584   3673   3753   3826   3899
                       3972   4045   4118   4198   4360*
GNS   = ******          486   4816   4817   4818   4819
HT    = 000011          361*  4607   4648
ILLTRP  014722          496   4339*
INTR    015114         2155   2441   3665   4190   4405*
IOTVEC= 000020          456*   686*   687*
LF    = 000012          362*  4642   4648
N     = 000013          471*   747*   765    766*   773    774*   778    779*   783    784*   789    789*   793
                       794*   798    799*   806    807*   813    814*   821    822*   843*   861    862*   869
                       870*   874    875*   879    880*   884    885*   889    890*   894    895*   902    903*
                       909    910*   917    918*   939*   957    958*   965    966*   970    971*   975    976*
                       980    981*   985    986*   990    991*   998    999*  1005   1006*  1013   1014*  1035*
```

1053	1054*	1061	1062*	1066	1067*	1071	1072*	1076	1077*	1081	1082*	1086
1087*	1094	1095*	1101	1102*	1109	1110*	1131*	1149	1150*	1156	1157*	1160
1161*	1164	1165*	1168	1169*	1172	1173*	1176	1177*	1181	1182*	1200*	1217
1218*	1224	1225*	1228	1229*	1232	1233*	1236	1237*	1240	1241*	1244	1245*
1249	1250*	1260	1261*	1286*	1304	1305*	1311	1312*	1315	1316*	1319	1320*
1323	1324*	1327	1328*	1331	1332*	1336	1337*	1347	1348*	1375*	1393	1394*
1400	1401*	1404	1405*	1408	1409*	1412	1413*	1416	1417*	1420	1421*	1425
1426*	1436	1437*	1462*	1480	1481*	1487	1488*	1491	1492*	1495	1496*	1499
1500*	1503	1504*	1507	1508*	1512	1513*	1523	1524*	1547*	1565	1566*	1572
1573*	1576	1577*	1580	1581*	1584	1585*	1588	1589*	1592	1593*	1597	1598*
1608	1609*	1631*	1649	1650*	1656	1657*	1660	1661*	1664	1665*	1668	1669*
1672	1673*	1676	1677*	1681	1682*	1699*	1717	1718*	1724	1725*	1728	1729*
1732	1733*	1736	1737*	1740	1741*	1744	1745*	1749	1750*	1760	1761*	1787*
1805	1806*	1812	1813*	1816	1817*	1820	1821*	1824	1825*	1828	1829*	1832
1833*	1837	1838*	1848	1849*	1876*	1894	1895*	1901	1902*	1905	1906*	1909
1910*	1913	1914*	1917	1918*	1921	1922*	1925	1927*	1937	1938*	1964*	1982
1983*	1989	1990*	1993	1994*	1997	1998*	2001	2002*	2005	2006*	2009	2010*
2014	2015*	2025	2026*	2051*	2069	2070*	2076	2077*	2080	2081*	2084	2085*
2088	2089*	2092	2093*	2096	2097*	2101	2102*	2112	2113*	2138*	2173	2174*
2180	2181*	2184	2185*	2188	2189*	2192	2193*	2196	2197*	2200	2201*	2205
2206*	2216	2217*	2249*	2267	2268*	2274	2275*	2278	2279*	2282	2283*	2286
2287*	2290	2291*	2294	2295*	2299	2300*	2310	2311*	2337*	2354	2355*	2361
2362*	2365	2366*	2369	2370*	2373	2374*	2377	2378*	2381	2382*	2386	2387*
2397	2398*	2424*	2460	2461*	2467	2468*	2471	2472*	2475	2476*	2479	2480*
2483	2484*	2487	2488*	2492	2493*	2503	2504*	2536*	2554	2555*	2561	[illegible]
2565	2566*	2569	2570*	2573	2574*	2577	2578*	2582	2583*	2588	2589*	2610*
2628	2629*	2635	2636*	2639	2640*	2643	2644*	2647	2648*	2651	2652*	2656
2657*	2662	2663*	2686*	2703	2704*	2710	2711*	2714	2715*	2718	2719*	2722
2723*	2726	2727*	2731	2732*	2737	2738*	2761*	2779	2780*	2786	2787*	2790
2791*	2794	2795*	2798	2799*	2802	2803*	2807	2808*	2813	2814*	2838*	2856
2857*	2863	2864*	2867	2868*	2871	2872*	2875	2876*	2879	2880*	2884	2885*
2890	2891*	2910*	2928	2929*	2935	2936*	2939	2940*	2943	2944*	2947	2948*
2951	2952*	2956	2957*	2962	2963*	2984*	3002	3003*	3009	3010*	3013	3014*
3017	3018*	3021	3022*	3025	3026*	3030	3031*	3036	3037*	3060*	3078	3079*
3085	3086*	3089	3090*	3093	3094*	3097	3098*	3101	3102*	3106	3107*	3112
3113*	3134*	3151	3152*	3158	3159*	3162	3163*	3166	3167*	3170	3171*	3174
3175*	3179	3180*	3185	3186*	3207*	3225	3226*	3232	3233*	3236	3237*	3240
3241*	3244	3245*	3248	3249*	3253	3254*	3259	3260*	3281*	3299	3300*	3306
3307*	3310	3311*	3314	3315*	3318	3319*	3322	3323*	3327	3328*	3333	3334*
3355*	3373	3374*	3380	3381*	3384	3385*	3388	3389*	3392	3393*	3396	3397*
3401	3402*	3407	3408*	3429*	3446	3447*	3453	3454*	3457	3458*	3461	3462*
3465	3466*	3469	3470*	3474	3475*	3480	3481*	3503*	3520	3521*	3527	3528*
3531	3532*	3535	3536*	3539	3540*	3543	3544*	3548	3549*	3554	3555*	3576*
3593	3594*	3600	3601*	3604	3605*	3608	3609*	3612	3613*	3616	3617*	3621
3622*	3627	3628*	3649*	3684	3685*	3691	3692*	3695	3696*	3699	3700*	3703
3704*	3707	3708*	3712	3713*	3718	3719*	3745*	3762	3763*	3769	3770*	3773
3774*	3777	3778*	3783	3784*	3789	3790*	3794	3795*	3818*	3836	3837*	3843
3844*	3847	3848*	3851	3852*	3857	3858*	3863	3864*	3868	3869*	3891*	3909
3910*	3916	3917*	3920	3921*	3924	3925*	3930	3931*	3936	3937*	3941	3942*
3964*	3982	3983*	3989	3990*	3993	3994*	3997	3998*	4003	4004*	4009	4010*
4014	4015*	4037*	4055	4056*	4062	4063*	4066	4067*	4070	4071*	4076	4077*
4082	4083*	4087	4088*	4110*	4128	4129*	4135	4136*	4139	4140*	4143	4144*
4149	4150*	4155	4156*	4160	4161*	4174*	4209	4210*	4216	4217*	4220	4221*
4224	4225*	4230	4231*	4236	4237*	4241	4242*					

NAME	016760	725	4823*											
NPREP	014732	747	843	939	1035	1131	1200	1286	1375	1462	1547	1631	1699	1787

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                        1876    1964    2051    2147    2249    2337    2433    2536    2610    2686    2761    2838    2910
                        2984    3060    3134    3207    3281    3355    3429    3503    3576    3658    3745    3818    3891
                        3964    4037    4110    4183    4350#
NXM     = 177777         473#
OLDPC   = 000706         667#    4323#   4331#   4339#
PS1     = 000674         662#    2154#   2440#   3664#   4189#   4406
PIRQ    = 177772         368#
PIRQVE= 000240           462#
PR0     = 000000         385#
PR1     = 000040         386#
PR2     = 000100         387#
PR3     = 000140         388#
PR4     = 000200         389#
PR5     = 000240         390#
PR6     = 000300         391#
PR7     = 000340         392#
PS      = 177776         365#     366
PSW     = 177776         366#
PWRVEC= 000024           457#     692#    693#    4472#   4473#   4482#   4489#   4501#   4502#
READDN  006100          2163#   2169
RECMPN  012650          3673#   3680
RECVTN  014350          4198#   4205
RESUBN  007074          2449#   2456
RESVEC= 000010           452#     702     703#    710#
RETN    015112          4394    4399#
SAVR6   000702           665#     819     915    1011    1107    1178    1246    1333    1422    1509    1594    1678    1746
                        1834    1923    2011    2098    2202    2296    2383    2489    2585    2659    2734    2810    2887
                        2959    3033    3109    3182    3256    3330    3404    3477    3551    3624    3715    4366#   4367#
SEND    015130          4407    4410#
STACK = 001100           356#
START   000716           507     675#
STKLMT= 177774           367#
ST45    013164          3747    3799#
ST46    013340          3820    3873#
ST47    013514          3893    3946#
ST50    013670          3966    4019#
ST51    014044          4039    4092#
ST52    014220          4112    4165#
ST53    014472          4185    4246#
SUBN  = 076051           463#    2261    2348    2452
SUBNPC  007104          2440    2452#
SWR     000540           572#     682     715#    721#    2138    2424    3649    4174    4300    4431    4445    4447    4453
                        4480    4494#   4538    4553    4556
SWREG   000176           488#     715
SW0   = 000001           420#
SW00  = 000001           410#     420
SW01  = 000002           409#     419
SW02  = 000004           408#     418
SW03  = 000010           407#     417
SW04  = 000020           406#     416
SW05  = 00004C           405#     415
SW06  = 000100           404#     414
SW07  = 000200           403#     413
SW08  = 000400           402#     412
SW09  = 001000           401#     411
SW1   = 000002           419#
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SW10  = 002000            400#
SW11  = 004000            399#
SW12  = 010000            398#
SW13  = 020000            397#
SW14  = 040000            396#
SW15  = 100000            395#
SW2   = 000004            418#
SW3   = 000010            417#
SW4   = 000020            416#
SW5   = 000040            415#
SW6   = 000100            414#
SW7   = 000200            413#
SW8   = 000400            412#
SW9   = 001000            411#
S1ADR   000646            651#    776     872     968    1064    4351*   4361
S1_N    000644            650#    771     867     963    1059    4350*   4360
S1T1    001550            749     829#
S1T10   003630           1377    1443#
S1T11   004044           1464    1530#
S1T12   004256           1549    1615#
S1T13   004442           1633    1687#
S1T14   004650           1701    1767#
S1T15   005066           1789    1855#
S1T16   005304           1878    1944#
S1T17   005522           1966    2032#
S1T2    002032            845     925#
S1T20   005736           2053    2119#
S1T21   006260           2149    2223#
S1T22   006514           2251    2317#
S1T23   006730           2339    2404#
S1T24   007256           2435    2510#
S1T25   007460           2538    2594#
S1T26   007640           2612    2668#
S1T27   010020           2688    2743#
S1T3    002314            941    1021#
S1T30   010202           2763    2819#
S1T31   010364           2840    2896#
S1T32   010542           2912    2968#
S1T33   010722           2986    3042#
S1T34   011104           3062    3118#
S1T35   011262           3136    3191#
S1T36   011442           3209    3265#
S1T37   011622           3283    3339#
S1T4    002576           1037    1117#
S1T40   012002           3357    3413#
S1T41   012160           3431    3486#
S1T42   012336           3505    3560#
S1T43   012514           3578    3633#
S1T44   013002           3660    3724#
S1T5    002772           1133    1187#
S1T6    003176           1202    1267#
S1T7    003412           1288    1354#
S2ADR   000652            653#    786     882     978    1074    4353*   4363
S2LN    000650            652#    781     877     973    1069    4352*   4362
S2T1    001551            751     831#
S2T10   003634           1379    1448#
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S2T1    004046          1466    1533*
S2T12   004260          1551    1618*
S2T13   004443          1635    1689*
S2T14   004653          1703    1771*
S2T15   005072          1791    1860*
S2T16   005307          1880    1948*
S2T17   005525          1968    2036*
S2T2    002033           847     927*
S2T20   005741          2055    2123*
S2T21   006264          2151    2228*
S2T22   006520          2253    2322*
S2T23   006733          2341    2408*
S2T24   007262          2437    2515*
S2T25   007463          2540    2598*
S2T26   007644          2614    2673*
S2T27   010024          2690    2748*
S2T3    002315           943    1023*
S2T30   010206          2765    2824*
S2T31   010366          2842    2899*
S2T32   010545          2914    2972*
S2T33   010726          2988    3047*
S2T34   011106          3064    3121*
S2T35   011264          3138    3194*
S2T36   011445          3211    3269*
S2T37   011626          3285    3344*
S2T4    002577          1039    1119*
S2T40   012006          3359    3418*
S2T41   012164          3433    3491*
S2T42   012341          3507    3564*
S2T43   012517          3580    3637*
S2T44   013006          3662    3729*
S2T5    002773          1135    1189*
S2T6    003202          1204    1272*
S2T7    003414          1290    1357*
TABLE   000662           657*
TBIT  = 000020           469*    4383    4385
TBITVE= 000014           453*     699*    700*
TBUF    000666           659*    731*    2158*   2444*   3668*   4193*   4410*
TCSR    000664           658*    729*    2140    2162*   2168    2426    2448*   2455    3651    3672*   3679    4178    4197*
                        4204    4393    4412*
TDONE   015070          2157    2443    3667    4192    4392*
TEMP    000710           668*    702*    710     4392*   4395*
TEMP1   000712           669*    754*    835     850*    931     946*    1027    1042*   1123
TEMP2   000714           670*    755*    836     851*    932     947*    1028    1043*   1124
TIMTRP  014712           494     4331*
TKVEC = 000060           460*
TPSW    000672           661*    736*    2156*   2241    2442*   2528    3666*   3736    4191*   4258
TPVEC = 000064           461*
TRAPVE= 000034           459*    690*    691*
TRTVEC= 000014           454*
TST1    001304           746*
TST10   003424          1353    1374*
TST11   003640          1442    1461*
TST12   004052          1529    1546*
TST13   004264          1614    1630*
TST14   004444          1686    1698*
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TST15   004662          1766    1786*
TST16   005100          1854    1875*
TST17   005316          1943    1963*
TST2    001566           942*
TST20   005532          2031    2050*
TST21   005746          2118    2137*
TST22   006310          2139    2145    2248*
TST23   006526          2316    2336*
TST24   006742          2403    2423*
TST25   007306          2425    2431    2535*
TST26   007466          2593    2609*
TST27   007650          2667    2685*
TST3    002050           938*
TST30   010030          2742    2760*
TST31   010212          2818    2837*
TST32   010370          2895    2909*
TST33   010550          2967    2983*
TST34   010732          3041    3059*
TST35   011112          3117    3133*
TST36   011270          3190    3206*
TST37   011450          3264    3280*
TST4    002332          1034*
TST40   011630          3338    3354*
TST41   012010          3412    3428*
TST42   012166          3485    3502*
TST43   012344          3559    3575*
TST44   012522          3632    3648*
TST45   013024          3650    3656    3744*
TST46   013176          3798    3817*
TST47   013352          3872    3890*
TST5    002614          1130*
TST50   013526          3945    3963*
TST51   013702          4018    4036*
TST52   014056          4091    4109*
TST53   014222          4164    4173*
TST6    002774          1186    1199*
TST7    003206          1266    1285*
TVECT   000670           660*    734*   2155*   2241*   2441*   2528*   3665*   3736*   4190*   4258*
TYPE  = 104401           725    4282    4503    4540    4544    4612    4709    4816*
TYPOC = 104402          4543    4817*
TYPON = 104404          4819*
TYPOS = 104403          4818*
TZERO   014702           492    4323*
T1      001374           763*    810
T1CONT  001402           756     770*
T2      001656           859*    906
T2CONT  001664           852     866*
T21CON  006004          2141    2143    2146*
T24CON  007000          2427    2429    2432*
T3      002140           955*   1002
T3CONT  002146           948     962*
T4      002422          1051*   1098
T4CONT  002430          1044    1058*
T44CON  012560          3652    3654    3657*
X     = 000000           472*
XPSW    015044           758     854     950    1046    1138    1207    1293    1382    1469    1554    1639    1706    1794
```

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                        1883    1971    2058    2159    2256    2344    2445    2542    2616    2692    2767    2844    2916
                        2990    3066    3140    3213    3287    3361    3435    3509    3582    3669    3751    3824    3897
                        3970    4043    4116    4194    4381#
$APTHD  000400           530     536#
$ASTAT= ****** U        4761    4776
$ATYC   016470          4732    4734#
$ATY1   016444          4730#
$ATY3   016452          4597    4731#
$ATY4   016462          4549    4733#
$AUTOB  000534           569#
$BASE   000642           631#    727
$BDADR  000522           564#    812*    908*   1004*   1100*
$BDDAT  000526           566#
$CHARC  016212          4614*   4624*   4631    4640*   4645#
$CKSWR= ****** U        4822
$CLR.T  014574          4286    4289#
$CMTAG  000500           552#    680
$CM3  = 000000           582#
$CPUOP  000614           605#
$CRLF   000563           584#   4540    4544    4568    4613    4648
$DEVCT  000576           596#
$DOAGN  014614          4278    4284    4291    4297#
$ENDAD  014604           517     723    4293#   4563
$ENDCT  014546           694    4280#
$ENULL  014660          4313#
$ENV    000606           601#   2142    2428    3653    4178    4546    4592    4739    4763
$ENVM   000607           602#    719    4594    4599    4741
$EOP    014516          4175    4181    4271#
$EOPCT  014540           694*   4277#   4281
$ERFLG  000503           555#   4422    4451    4457*   4467    4531*   4568
$ERMAX  000515           561#    696*   4463*   4467
$ERROR  015546           688    4530#
$ERRPC  000516           562#   4535*   4536*   4537    4541    4568
$ERRTB  000644           648#
$ERTTL  000512           559#   4534*   4568
$ESCAP  000560           582#    695*   4462*   4559    4561    4568
$ETABL  000606           600#
$ETEND  000644           542     632#
$FATAL  000570           593#    675*   4767*
$FFLG   016710          4730*   4733*   4761    4770*   4778#
$FILLC  000556           580#   4617    4648
$FILLS  000555           579#   4648
$GDADR  000520           563#
$GDDAT  000524           565#
$GET42  014556          4283#
$GTSWR= ****** U        4821
$HIBTS  000400           537#
$ICNT   000504           556#
$ILLUP  015530          4472    4488    4510#
$INTAG  000535           570#
$ITEMB  000514           560#   4537*   4548    4568
$LF     000564           585#   4568    4648
$LFLG   016707          4771*   4777#
$LOOP   014652          4305    4309#   4506
$LPADR  000506           557#    712*   4455*   4460*   4465    4467
$LPERR  000510           558#    713*   4455    4461*   4467    4558
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$MADR1  000620            618#
$MADR2  000624            622#
$MADR3  000630            625#
$MADR4  000634            628#
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CROSS REFERENCE TABLE -- USER SYMBOLS


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CMPREP    331#  2536  2610  2686  2761  2838  2910  2984  3060  3134  3207  3281  3355  3429  3503
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COMMEN    463#
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ERROR        357#    765     773     778     783     788     793     798     806     813     821     861     869     874     879
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GETSWR       463#
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MSRC         337#    829     925    1021    1117    1187    1267    1354    1443    1530    1615    1687    1757    1855    1944
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MULT         463#
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NUMERI       341#   1131    1200    1286    1375    1462    1547    1631    1699    1787    1876    1964    2051    2249    2337
NUMINT       342#   2138    2424
POP          323#    463#   4494    4495    4773    4774
PUSH         323#    463#   4474    4480    4734    4736    4757
REPORT       463#
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SCOPE        358#    746     842     938    1034    1130    1199    1285    1374    1461    1546    1630    1698    1786    1875
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            3206    3280    3354    3428    3502    3575    3648    3744    3817    3890    3963    4036    4109    4173    4272
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SETUP     323#    463#
SKIP      463#
SKPINT    331#   2138    2424    3649
SLASH     463#
SPACE     463#
STARS     323#    463#    513     523     525     532     547     586     589     743     745     839     841     935     937
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         2908    2980    2982    3056    3058    3130    3132    3203    3205    3277    3279    3351    3353    3425    3427
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         4035    4106    4108    4170    4172    4265    4419    4470    4486    4519    4571    4651    4729    4787
SWRSJ     463#
TCVTAN    343#   3767    3841    3914    3987    4060    4133    4214
TRMTRP   4808#
TSTANS    340#   1254    1341    1430    1517    1602    1754    1842    1931    2019    2106    2210    2304    2391    2497
TSTCC     339#   1145    1213    1300    1389    1476    1561    1645    1713    1801    1890    1978    2065    2167    2263
         2350    2454    2550    2624    2699    2775    2852    2924    2998    3074    3147    3221    3295    3369    3442
         3516    3589    3678    3758    3832    3905    3978    4051    4124    4203
TSTGR     336#   1154    1222    1309    1398    1485    1570    1654    1722    1810    1899    1987    2074    2178    2272
         2359    2465    2559    2633    2708    2784    2861    2933    3007    3083    3156    3230    3304    3378    3451
         3525    3598    3689
TSTREG    350#    770     866     962    1058
TTY       333#   2154    2440    3664    4189
TYPBIN    463#
TYPDEC    463#
TYPNAM    463#
TYPNUM    463#
TYPOCS    463#
TYPOCT    463#   4541
TYPTXT    463#
$$CMRE    545#
$$CMTM    545#
$$ESCA    463#
$$NEWT    463#    743     839     935    1031    1127    1196    1282    1371    1458    1543    1627    1695    1783    1872
         1960    2047    2134    2245    2333    2420    2532    2606    2682    2757    2834    2906    2980    3056    3130
         3203    3277    3351    3425    3499    3572    3645    3741    3814    3887    3960    4033    4106    4170
$$SET    4808#   4817    4818    4819
$$SKIP    463#
.EQUAT    323#    353
.SETUP    323#    478
.$ACT1    323#    511
.$APTB    587#
.$APTH    323#    521
.$APTY    323#   4727
.$CATC    323#    480
.$CMTA    323#    545
.$EOP     323#   4263
.$ERRO    323#   4517
.$PCWE    323#   4468
.$SCOP    323#   4417
.$TRAP    323#   4785
.$TYPE    323#   4569
.$TYPO    323#   4643
```

. ABS. 017040   000

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

DVKAJA,DVKAJA/SOL/CRF=DVKAJA.P11
RUN-TIME: 67 58 6 SECONDS
RUN-TIME RATIO: 522/132=3.9
CORE USED: 23K (45 PAGES)

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