DCF11-AA

DCF11-AA DIAG
CJKDBDO

AH-F140D-MC
FICHE 1 OF 2

AUG 1981
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DCF11-AA DIAG
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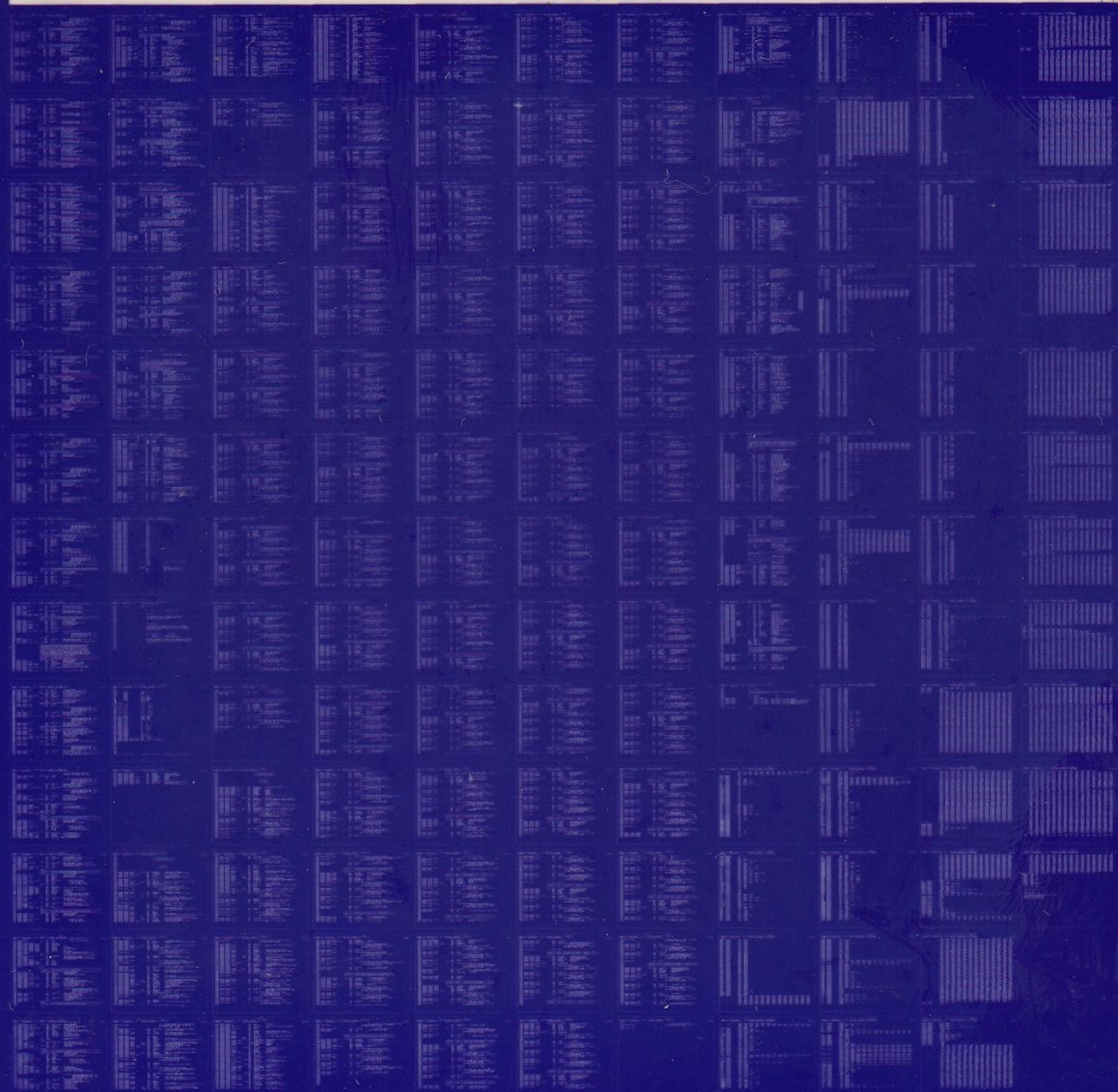

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000000                          .REPT 0
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IDENTIFICATION

PRODUCT CODE: AC-F141D-MC

PRODUCT NAME: CJKDBD0 DCF11-AA CPU DIAG

DATE: JAN-81

MAINTAINER: DIAGNOSTIC ENGINEERING

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1.0 GENERAL INFORMATION

1.1 HISTORY:

THIS PROGRAM IS A COMBINED VERSION OF THE THREE BASIC 11/34 DIAGNOSTIC PROGRAMS WITH MODIFICATIONS AND ENHANCEMENTS MADE TO ACCOUNT FOR THE DIFFERENCES BETWEEN THE TWO PROCESSORS.

1.2 PROGRAM DESCRIPTION:

THIS PROGRAM CONTAINS THREE PARTS: CPU, TRAP AND EIS TESTS. IN THE FIRST AND SECOND PARTS, THE PROGRAM WILL HALT ON ERROR. IN PART THREE, EIS TEST, WHEN AN ERROR IS DETECTED, THE ERROR PC AND ERROR NUMBER WILL BE TYPED, THEN THE PROGRAM WILL CONTINUE EXECUTION.
LOOP ON ERROR IS PROVIDED BY MANUALLY MODIFYING SOME APPROPRIATE MEMORY LOCATIONS. SEE THE LISTING OF THAT TEST FOR DETAILS AND INSTRUCTIONS.

THIS PROGRAM ASSUMES SOME OPTIONS (FOR EIS TEST ONLY), THEY ARE:
1. ENABLE ERROR PRINTOUTS, 2.CONTINUE EXECUTION ON ERROR.

1.3 ABSTRACT

PART ONE:

CPU TEST, THIS IS THE FIRST PART OF THE MAIN PROGRAM. THIS TEST CHECK OUT THE BASIC PDP-11 INSTRUCTIONS IN EVERY ADDRESSING MODES WITH VARIOUS TYPES OF DATA PATTERNS.

PART TWO:

TRAP TEST, THIS IS THE SECOND PART OF THE MAIN PROGRAM. THIS IS A TEST OF ALL OPERATIONS AND INSTRUCTIONS THAT CAUSE TRAPS. ALSO TESTED ARE TRAP OVERFLOW CONDITIONS, ODDITIES OF REGISTER 6, INTERRUPTS , THE RESET AND WAIT INSTRUCTIONS. THIS PROGRAM CHECKS THAT ON ALL TRAP OPERATIONS REGISTER 6 IS DECREMENTED THE CORRECT AMOUNT, THAT THE CORRECT PC IS SAVED ON THE STACK, THAT THE OLD CONDITION CODES AND PRIORITY ARE PLACED ON THE STACK AND THAT THE NEW STATUS AND CONDITION CODES ARE CORRECT. BOTH THE "TRAP" AND "EMT" TRAP INSTRUCTIONS ARE TESTED TO SEE THAT ALL COMBINATIONS WILL TRAP. CHECKED ALSO IS THAT ALL RESERVED INSTRUCTIONS WILL TRAP. THE TRACE BIT IS CHECKED TO SEE IF IT CAUSES A TRAP.
THE RTI AND RTT INSTRUCTIONS ARE CHECKED. STACK OVERFLOW IS ALSO CHECKED FOR ALL THE TRAP INSTRUCTIONS.

SPECIAL CHECKS ARE MADE TO SEE IF BUS
ERROR TRAPS OCCUR ON NON-EXISTENT MEMORY.
ALL INSTRUCTIONS THAT ARE RESERVED SHOULD TRAP TO LOCATION 10,
AND THE PC THAT POINTS TO THE TRAPPING INSTRUCTION
SHOULD BE PLACED ON THE STACK.

PART THREE:

THIS PROGRAM TESTS THE EXTENDED INSTRUCTION SET
<ASH, ASHC, MUL, AND DIV> USING REGISTERS 0-5 AT LEAST
ONCE WITH EACH INSTRUCTION.
THIS PROGRAM TESTS ALL THE EIS INSTRUCTIONS OF THE 11/34
FOR ASH AND ASHC INSTRUCTIONS EVERY EVEN PASS IS EXECUTED
WITH DESTINATION MODE 0 FOR ALL REGISTERS AND EVERY ODD PASS
WITH DESTINATION MODE OF 67. THE DIAGNOSTIC DOES NOT MAKE A
PASS WITH T BIT SET.

2.0 HARDWARE REQUIREMENT

A PROCESSOR WITH DCF11-AA CHIP SET, A MINIMUN OF 16K OF
MEMORY AND A CONSOLE TERMINAL. IF PROGRAM IS RUNNING
UNDER APT OR ACT, THE CONSOLE TERMINAL IS NOT NECESSARY.

3.0 RELATED DOCUMENTS AND STANDARDS:

ACT11/XXDP PROGRAMMING SPECIFICATION
STANDARD APT SYSTEM TO A PDP11 DIAGNOSTIC INTERFACE
PDP11 MAINDEC SYSMAC PACKAGE
KDF11-A MODULE SPECIFICATION

4.0 STARTING PROCEDURES

THE PROGRAM IS STARTED BY LOADING ADDRESS 200.
THE RESTART ADDRESS IS 1024.
PROGRAM IDENTIFICATION WILL BE TYPED AFTER THE FIRST
PASS OF THE WHOLE PROGRAM.

5.0 TRAPCATCHER ABSTRACTS

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

THE PRINCIPLE OF THIS ROUTINE IS: THE VECTOR ENTRANCE
ADDRESS POINTS TO THE NEXT SEQUENTIAL WORD WHICH WILL CON-
TAIN A HALT (000000) (THIS LOCATION IS ALSO THE STATUS

WORD FOR THAT VECTOR ENTRANCE. BUT THIS WILL HAVE NO EFFECT
ON IT ALSO BEING THE NEXT INSTRUCTION).

IF A HALT OCCURS IN THE TRAP OR INTERRUPT VECTOR AREA,
REGISTER SIX SHOULD BE EXAMINED TO DETERMINE ITS CONTENTS,
THEN USE REGISTER SIX CONTENTS AS AN ADDRESS TO DETERMINE
WHERE THE PROGRAM WAS. WHEN THE INTERRUPT OR
TRAP OCCURRED; MEMORY AS SPECIFIED BY R6 CONTAINS THE
PC OF THE INSTRUCTION FOLLOWING THE INSTRUCTION WHERE THE
TRAP OCCURRED.
THE CONTENTS OF LOCATION '$TESTN'(304) CONTAINS
THE TEST NUMBER THAT IT WAS DOING BEFORE IT
TRAPPED.

6.1 ERROR HANDLING IN PART ONE AND PART TWO

IN PARTS ONE AND TWO, ALL ERRORS WILL CAUSE A HALT.

THE PROGRAM CHECKS TO SEE THAT THE PC. DOESN'T JUMP ERRATICALLY
WITHIN THE TESTS BY USING A SEQUENCE COUNT CALLED '$TESTN'.

EXAMPLE

```
TSTA:   INC     (R2)            ;INCREMENT THE TEST NUMBER
        CMP     #A,(R2)         ;COMPARE FOR THE RIGHT TEST
        BNE     TSTA+1-10       ;IF NOT CORRECT BRANCH TO A HALT
```

* R2 CONTAINS THE ADDRESS OF $TESTN (304).
  A IS THE CURRENT TEST NUMBER.

IF AN ERROR IS DETECTED, THE PROGRAM WILL HALT
IT COULD BE BECAUSE OF TWO REASONS.
A) WRONG TEST NUMBER (SEQUENCE ERROR)
B) ERROR IN THE PRESENT TEST.

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

6.2 ERROR HANDLING IN PART THREE

IN PART THREE, ANY ERROR, INCLUDES SEQUENCE CHECK ERROR WILL
CAUSE THE ERROR MESSAGE TO BE TYPED. THE PROGRAM WILL
CONTINUE EXECUTION AFTER TYPE OUT.

THE ERROR REPORTING FORMAT IS AS FOLLOWS:

ERROR. PC AND ERROR # ARE:
 PC #

ERROR #

7.0 SWITCH SETTINGS

SINCE NO HARDWARE SWITCH REGISTER IS AVAILABLE, THE PROGRAM AUTOMATICALLY USES THE CONTENTS OF LOC. 176 AS THE SOFTWARE SWITCH REGISTER. THE INITIAL CONTENT OF LOC. 176 IS 000000, THE USER MAY PRE-SET THIS LOCATION BEFORE STARTING THE PROGRAM. IF THE PROGRAM IS BEING RUN IN APT MODE (BIT 0 OF $ENV SET TO A ONE) THEN THE LOCATION $SWREG IS USED AS THE SWITCH REGISTER.

BIT #	OCTAL VALUE	FUNCTION
15	100000.....	HALT ON ERROR
13	020000.....	INHIBIT ERROR PRINTOUT
2	000004.....	PROGRAM RESERVED -- PROGRAM WILL SET IF CIS OPTION IS AVAILABLE
1	000002.....	30K SYSTEM DO NOT CHECK FOR TRAPS BETWEEN 28K-30K
0	000001.....	SKIP TRAPS TEST

NOTE: SWITCHES "15" AND "13" ONLY EFFECT PART THREE OF THIS DIAGNOSTIC. PARTS 1 AND 2 ALWAYS HALT ON ERROR.

ALSO, WITHIN THE APT TABLE, AN 8 BIT BYTE $ENVM [LOCATION 321] HAS BEEN USED TO DEFINE THE OPERATING MODE. ALL TYPEOUTS CAN BE SUPPRESSED BY MAKING BIT 5 OF BYTE $ENVM HIGH, IN OTHER WORDS BY PLACING A 20000 IN LOCATION 320.

8.0 EXECUTION TIMES

THE RUN TIME FOR A SINGLE RUN (THE FIRST PASS) IS ONE SECOND.
AFTER THE FIRST PASS, THE PROGRAM WILL ITERATE EVERY 15 TIMES BEFORE THE END OF PASS MESSAGE IS TYPED AGAIN. THE RUN TIME FOR EACH ADDITIONAL END OF PASS MESSAGE TYPED IS APPROXIMATELY 15 SECONDS.

9.0 ROUTINES ABSTRACT

9.1 HALT ROUTINE (APPLICABLE ONLY TO PART THREE).

THIS ROUTINE IS CALLED VIA A JSR INSTRUCTION EACH TIME AN ERROR IS SEEN AND AN ERROR MESSAGE IS THEN TYPED OUT UNLESS IT IS SUPRESSED BY THE SWITCHES.

```
                        THE COMMENTS BESIDE THE CALL TO THE HALT SUBROUTINE
                        TELLS WHAT WAS BEING TESTED AND WHAT WAS EXPECTED. ALL
                        PRINTOUTS WILL BE SUPPRESSED WHEN BIT 5 OF LOCATION
                        $ENVM IS HIGH.
                        WHILE RUNNING UNDER APT THE DIAGNOSTIC WILL NOT
                        SUPPORT SPOOLING OF CONSOLE OUTPUTS.


9.2     POWER FAIL ROUTINE
        ------------------

                        IF A POWER FAIL OCCURS (FOLLOWED BY A POWER UP), THE
                        MESSAGE ''POWER FAIL'' IS TYPED OUT AND THE PROGRAM WILL
                        RESTART EXECUTION AT ''RESTRT''.


        .ENDR
```

```
                                        .TITLE  CJKDB-D  DCF11-AA CPU DIAG.
                                        .ENABLE ABS
                                        .NLIST  CND,MC,MD
                                        .LIST   ME
        000240                          SCOPE=NOP
        000007                          R7=%7
        000006                          R6=%6
        177776                          PS=177776
        177560                          TKS=177560
        177562                          TKB=177562
        177564                          TPS=177564
        177566                          TPB-177566
        140000                          USRM-140000
        030000                          PUSRM=30000
                                .SBTTL  ACT11 HOOKS

                                ;*******************************************************************************
                                ;HOOKS REQUIRED BY ACT11
        000400                          $SVPC=.                 ;SAVE PC
        000046                          .-46
000046  060554                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
        000052                          .-52
000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
        000400                          .=$SVPC                 ;; RESTORE PC
        000300                          .=300
                                .SBTTL  APT MAILBOX-ETABLE

                                ;*******************************************************************************
                                .EVEN
000300                          $MAIL:                          ;;APT MAILBOX
000300  000000                  $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
000302  000000                  $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
000304  000000                  $TESTN: .WORD   ATESTN          ;;TEST NUMBER
000306  000000                  $PASS:  .WORD   APASS           ;;PASS COUNT
000310  000000                  $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
000312  000000                  $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
000314  000000                  $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
000316  000000                  $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
000320                          $ETABLE:                        ;;APT ENVIRONMENT TABLE
000320     000                  $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
000321     000                  $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
000322  000000                  $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
000324  000000                  $USWR:  .WORD   AUSWR           ;;USER SWITCHES
000326  000000                  $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
                                ;*                              BITS 15-11=CPU TYPE
                                ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45 05
                                ;*                                      11/70=06,PDQ=07,Q=10
                                ;*                              BIT 10=REAL TIME CLOCK
                                ;*                              BIT  9=FLOATING POINT PROCESSOR
                                ;*                              BIT  8=MEMORY MANAGEMENT
000330                          $ETEND:
                                .MEXIT
                                .SBTTL  APT PARAMETER BLOCK
```

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

000330                          $APTHD:
000330  000000                  $HIBTS: .WORD   0        ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
000332  000300                  $MBADR: .WORD   $MAIL    ;;ADDRESS OF APT MAILBOX (BITS 0-15)
000334  000013                  $TSTM:  .WORD   13       ;;RUN TIM OF LONGEST TEST
000336  000020                  $PASTM: .WORD   20       ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
000340  000005                  $UNITM: .WORD   5        ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
000342  000014                          .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
                                ;*******************************************************************
                                ;SOME POINTERS TO CPU TRAP HANDLERS
                                ;*******************************************************************
        000004                          .-4
000004  027324                          T04
000006  000000                          0
000010  027334                          T010
000012  000000                          0
000014  027344                          T014
        000030                          .-30
000030  027354                          T030
000032  000000                          0
000034  027364                          T034
000036  000000                          0
        000114                          .-114
000114  027374                          T0114
000116  000000                          0
        000244                          .-244
000244  027404                          T0244
000246  000000                          0
000250  027414                          T0250
000252  000000                          0

        000172                  .=172
000172  000000                  LPADR:          0        ;LOOP ADDRESS (EIS TEST)
000174  000000                  DISPREG:        0        ;SOFTWARE DISPLAY REGISTER
000176  000000                  SWREG:          0        ;SOFTWARE SWITCH REGISTER

                                ;*******************************************************************
                                ;DATA TABLE FOR USE IN ADDRESSING MODE TESTS
                                ;*******************************************************************
        000370                          .=370
000370  000000  000000  000000          0,0,0,0,0,0
000376  000000  000000  000000
000404  000001  000001  177777          1,1,-1
```

```
                                        ;*******************************************************************************
                                        ;SET UP STARTING ADDRESS
        000302                          $ERROR=$FATAL
        000304                          $TSTNM=$TESTN
        001000                          .=1000
001000  000000                          STBOT:  .WORD 0                         ;STACK POINTER

        000200                                  .=200
000200  000167  000576                          JMP     START
000204  012706  001000                          MOV     #STBOT,R6               ;SET STACK POINTER
000210  012702  000304                          MOV     #$TESTN,R2              ;SET MAILBOX POINTER
000214  000137                                  JMP     @(PC)+                  ;JUMP TO SUBTEST
000216  000000                                  0                               ;ADDR. OF SUBTEST GOES HERE

        001002                          .=1002
                                        .SBTTL **STARTING OF CPU TEST **
001002  012737  061074  000024          START:  MOV     #PWRDN,@#24             ;SET UP FOR POWER FAIL
001010  012737  000000  000306                  MOV     #0,@#$PASS      ;CLEAR PASS COUNT
001016  012737  000016  062540                  MOV     #16,@#PASSPT    ;SET PRINT COUNTER
001024  012706  001000          RESTRT: MOV     #STBOT,R6       ;INITIALIZE STACK POINTER
001030  012702  000304                  MOV     #$TESTN,R2      ;SET UP POINTER TO MESSAGE TYPE
001034  012737  000000  000304          MOV     #0,@#$TSTNM     ;CLEAR TEST NUMBER
001042  012737  000000  000302          MOV     #0,@#$ERROR     ;CLEAR ERROR NUMBER
001050  012737  000000  000300          MOV     #0,@#$MSGTY     ;CLEAR MESSAGE TYPE(FOR APT)
                                        ;*******************************************************************************
                                        ;TEST 1 CHECK BRANCHES ON Z BIT
                                        ;*******************************************************************************
001056  005212                          TS1:    INC     (R2)            ;UPDATE TEST NUMBER
001060  022712  000001                          CMP     #1,(R2)         ;SEQUENCE ERROR?
001064  001024                                  BNE     TS2-10  ;BR TO ERROR HALT ON SEQ ERROR
001066  000257                                  CCC                     ;CLEAR ALL CONDITION CODES
001070  001401                                  BEQ     BRA1            ;SHOULD BRANCH
001072  000404                                  BR      BRA2            ;BAD BRANCH OF Z-BIT
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           BRANCH INSTRUCTION AND         <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           FOLLOWING W/ 774               <
001074                                  BRA1:
001074  012742  000001                          MOV     #1,-(R2)        ;MOVE TO MAILBOX #  *******  1  *******
001100  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001102  000000                                  HALT                    ;SHOULD HAVE BRANCHED: Z-0
001104                                  BRA2:
001104  001004                                  BNE     BRA3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 767           <
001106  012742  000002                          MOV     #2,-(R2)        ;MOVE TO MAILBOX #  *******  2  *******
001112  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001114  000000                                  HALT                    ;
001116  000264                          BRA3:   SEZ
001120  001001                                  BNE     BRA4
001122  000404                                  BR      BRA5
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                        ;           BRANCH INSTRUCTION AND         <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
```

```
                                                        ;            FOLLOWING W/ 760                <-
001124                          BRA4:
001124  012742  000003                  MOV     #3,-(R2)        ;MOVE TO MAILBOX #  *******  3  *******
001130  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001132  000000                          HALT                    ;SHOULD NOT HAVE BRANCHED HERE ON Z-1
001134                          BRA5:
001134  001404                          BEQ     TS2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=-=
                                                        ;           CONDITIONAL BRANCH INST. AND    <=-==
                                                        ;           REPLACE THE MOVE INSTRUCTION    <-=-=
                                                        ;           WHICH FOLLOWS W/ 753            <====
001136  012742  000004                  MOV     #4,-(R2)        ;MOVE TO MAILBOX #  *******  4  *******
001142  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001144  000000                          HALT                    ;SHOULD HAVE BRANCHED ON Z=1
                                                        ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                .SBTTL  DATA PATH TESTS
                                ;
                                ;       THE DATA PATH TESTS ARE USED TO VERIFY THAT VARIOUS
                                ;DATA PATTERNS CAN BE SUCCESSFULLY MOVED THROUGH THE DATA PATHS
                                ;MOVE AND COMPARE MODE 2,3 INSTRUCTIONS ARE USED TO PASS AND
                                ;TEST VARIOUS DATA PATTERNS IN THE DATA PATHS.
                                ;       THE TEST EXERCISES THE INTERNAL DATA PATHS,  AND THE UNIBUS
                                ;DATA TRANSCIEVERS.
                                ;       IF THESE TESTS FAIL, EXAMINE THE TARGET LOCATION (LOC. 0)
                                ;TO SEE WHICH BITS OF THE DATA PATH ARE FAILING.
                                ;*******************************************************************
                                ;TEST 2 TEST OF ZEROES IN THE DATA PATH
                                ;*******************************************************************
001146  005212                  TS2:    INC     (R2)            ;UPDATE TEST NUMBER
001150  022712  000002                  CMP     #2,(R2)         ;SEQUENCE ERROR?
001154  001006                          BNE     TS3-10  ;BR TO ERROR HALT ON SEQ ERROR
001156  012737  000000  000000          MOV     #0,@#0          ;MOVE ZEROES THRU ADDRESS LINES, DATA
                                                                ;LINES AND INTERNAL PATHS
001164  005737  000000                  TST     @#0             ;SUCCESSFUL?
001170  001404                          BEQ     TS3
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                        ;           CONDITIONAL BRANCH INST. AND    <-
                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                        ;           WHICH FOLLOWS W/ 771            <
001172  012742  000005                  MOV     #5,-(R2)        ;MOVE TO MAILBOX #  *******  5  *******
001176  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001200  000000                          HALT                    ;DATA INCORRECT
                                                        ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;TEST 3 TEST OF PATTERN 125252 IN DATA PATH
                                ;*******************************************************************
001202  005212                  TS3:    INC     (R2)            ;UPDATE TEST NUMBER
001204  022712  000003                  CMP     #3,(R2)         ;SEQUENCE ERROR?
001210  001007                          BNE     TS4-10  ;BR TO ERROR HALT ON SEQ ERROR
001212  012737  125252  000000          MOV     #125252,@#0     ;MOVE ALTERNATING ONES AND ZEROES
                                                                ;THRU DATA PATHS
001220  022737  125252  000000          CMP     #125252,@#0     ;SUCCESSFUL
001226  001404                          BEQ     TS4
```

```
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 770           <====
001230  012742  000006                  MOV     #6,-(R2)        ;MOVE TO MAILBOX #  *******  6  *******
001234  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001236  000000                          HALT                    ;DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 4 TEST OF PATTERN 052525 IN DATA PATH
                                ;*******************************************************************************
001240  005212                  TS4:    INC     (R2)            ;UPDATE TEST NUMBER
001242  022712  000004                  CMP     #4,(R2)         ;SEQUENCE ERROR?
001246  001007                          BNE     TS5-10  ;BR TO ERROR HALT ON SEQ ERROR
001250  012737  052525  000000          MOV     #052525,@#0     ;MOVE ALTERNATING ZEROES AND ONES
                                                                ;THRU DATA PATH
001256  022737  052525  000000          CMP     #052525,@#0     ;SUCCESSFUL?
001264  001404                          BEQ     TS5
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=---
                                                                ;           CONDITIONAL BRANCH INST. AND   <=- -
                                                                ;           REPLACE THE MOVE INSTRUCTION   <--=-
                                                                ;           WHICH FOLLOWS W/ 770           < = -
001266  012742  000007                  MOV     #7,-(R2)        ;MOVE TO MAILBOX #  *******  7  *******
001272  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001274  000000                          HALT                    ;DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 5 TEST OF ALL ONES IN DATA PATH
                                ;*******************************************************************************
001276  005212                  TS5:    INC     (R2)            ;UPDATE TEST NUMBER
001300  022712  000005                  CMP     #5,(R2)         ;SEQUENCE ERROR?
001304  001007                          BNE     TS6-10  ;BR TO ERROR HALT ON SEQ ERROR
001306  012737  177777  000000          MOV     #177777,@#0     ;MOVE ONES THRU DATA PATH
001314  022737  177777  000000          CMP     #177777,@#0     ;SUCCESSFUL
001322  001404                          BEQ     TS6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-  -
                                                                ;           CONDITIONAL BRANCH INST. AND   <   -
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 770           < -
001324  012742  000010                  MOV     #10,-(R2)       ;MOVE TO MAILBOX #  *******  10  *******
001330  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001332  000000                          HALT                    ;DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                .SBTTL  B-REGISTER TEST
                                ;
                                ;       THE B-REGISTER (LOCATION 0) SHIFTING LOGIC TESTS ARE USED
                                ;TO TEST THAT THE B-REGISTER CAN HOLD VARIOUS DATA PATTERNS AND THAT
                                ;THE ASSOCIATED LOGIC SUPPORTS THE SHIFTING FUNCTIONS WITHIN THE
                                ;B-REGISTER AND C-BIT.
                                ;A ONE IS SHIFTED THROUGH EVERY BIT IN THE B-REGISTER AND C-BIT IN
                                ;BOTH DIRECTIONS.
                                ;       THE B-REGISTER ITSELF IS TESTED IN ITS ABILITY AS A BUFFER AND AS
```

```
                                        ;A SHIFT REGISTER.  DATA IS ALSO PASSED THROUGH THE DATA PATH AND ALU.
                                        ;       IF THESE TESTS FAIL, EXAMINE THE TARGET LOCATION (LOC. 0) TO SEE
                                        ;WHICH BITS OF THE B-REGISTER MAY BE FAILING.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 6 SHIFT BIT 0 TO BIT 1
                                        ;*******************************************************************************
001334  005212                          TS6:    INC     (R2)            ;UPDATE TEST NUMBER
001336  022712  000006                          CMP     #6,(R2)         ;SEQUENCE ERROR?
001342  001012                                  BNE     TS7-10  ;BR TO ERROR HALT ON SEQ ERROR
001344  000241                                  CLC                     ;CLEAR CARRY BIT
001346  012737  000001  000000                  MOV     #1,@#0          ;LOAD A 1
001354  006137  000000                          ROL     @#0             ;SHIFT LEFT
001360  022737  000002  000000                  CMP     #2,@#0          ;SUCCESSFUL
001366  001404                                  BEQ     TS7
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 765           <-
001370  012742  000011                          MOV     #11,-(R2)       ;MOVE TO MAILBOX #  *******  11  *******
001374  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001376  000000                                  HALT                    ;BIT 1 NOT SET
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 7 SHIFT CARRY INTO BIT 0
                                        ;*******************************************************************************
001400  005212                          TS7:    INC     (R2)            ;UPDATE TEST NUMBER
001402  022712  000007                          CMP     #7,(R2)         ;SEQUENCE ERROR?
001406  001017                                  BNE     TS10-10         ;BR TO ERROR HALT ON SEQ ERROR
001410  012737  000000  000000                  MOV     #0,@#0          ;CLEAR LOCATION
001416  000261                                  SEC                     ;SET CARRY
001420  006137  000000                          ROL     @#0             ;ROTATE CARRY BIT TO BIT 0
001424  103014                                  BCC     TS10
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 770           <
001426  012742  000012                          MOV     #12,-(R2)       ;MOVE TO MAILBOX #  *******  12  *******
001432  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001434  000000                                  HALT                    ;CARRY CLEAR
                                                                        ;  OR SEQUENCE ERROR
001436  022737  000001  000000                  CMP     #1,@#0          ;BIT 0 SET
001444  001404                                  BEQ     TS10
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 760           <-
001446  012742  000013                          MOV     #13,-(R2)       ;MOVE TO MAILBOX #  *******  13  *******
001452  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001454  000000                                  HALT                    ;BIT 0 NOT SET
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 10        LEFT SHIFT FROM BIT 0 TO C-BIT
                                        ;*******************************************************************************
```

```
001456  005212                  TS10:   INC     (R2)            ;UPDATE TEST NUMBER
001460  022712  000010                  CMP     #10,(R2)        ;SEQUENCE ERROR?
001464  001014                          BNE     TS11-10         ;BR TO ERROR HALT ON SEQ ERROR
001466  012737  000001  000000          MOV     #1,@#0          ;SET BIT 0
001474  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
001500  000241                          CLC                     ;CLEAR C-BIT
001502  005200                  SHL:    INC     R0              ;INCREMENT BIT COUNTER
001504  001404                          BEQ     SHLE            ;BR TO ERROR HALT IF BIT IS LOST
001506  006137  000000                  ROL     @#0             ;SHIFT LEFT ONE POSITION
001512  103373                          BCC     SHL             ;BRANCH IF C-BIT NOT SET
001514  001404                          BEQ     TS11
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 763            <====
001516                          SHLE:
001516  012742  000014                  MOV     #14,-(R2)       ;MOVE TO MAILBOX #  *******  14  *******
001522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001524  000000                          HALT                    ;LEFT SHIFTING LOGIC FAILED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 11        SHIFT BIT 15 TO BIT 14
                                ;*******************************************************************************
001526  005212                  TS11:   INC     (R2)            ;UPDATE TEST NUMBER
001530  022712  000011                  CMP     #11,(R2)        ;SEQUENCE ERROR?
001534  001012                          BNE     TS12-10         ;BR TO ERROR HALT ON SEQ ERROR
001536  012737  100000  000000          MOV     #100000,@#0     ;SET BIT 15
001544  000241                          CLC                     ;CLEAR CARRY
001546  006037  000000                  ROR     @#0             ;SHIFT BIT 15 TO BIT 14
001552  022737  040000  000000          CMP     #40000,@#0      ;SUCCESSFUL
001560  001404                          BEQ     TS12
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 765            <
001562  012742  000015                  MOV     #15,-(R2)       ;MOVE TO MAILBOX #  *******  15  *******
001566  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001570  000000                          HALT                    ;BIT 14 NOT SET
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 12        RIGHT SHIFT FROM BIT 15 TO C-BIT
                                ;*******************************************************************************
001572  005212                  TS12:   INC     (R2)            ;UPDATE TEST NUMBER
001574  022712  000012                  CMP     #12,(R2)        ;SEQUENCE ERROR?
001600  001014                          BNE     TS13-10         ;BR TO ERROR HALT ON SEQ ERROR
001602  012737  100000  000000          MOV     #100000,@#0     ;SET BIT 15
001610  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
001614  000241                          CLC                     ;CLEAR C-BIT
001616  005200                  SHR:    INC     R0              ;INCREMENT BIT COUNTER
001620  001404                          BEQ     SHRE            ;BR TO ERROR HALT IF BIT IS LOST
001622  006037  000000                  ROR     @#0             ;ROTATE RIGHT ONE POSITION
001626  103373                          BCC     SHR             ;BRANCH IF C-BIT CLEAR
001630  001404                          BEQ     TS13
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

```
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 763           <---
001632                          SHRE:
001632  012742  000016                  MOV     #16,-(R2)       ;MOVE TO MAILBOX #  *******  16  *******
001636  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001640  000000                          HALT                    ;RIGHT SHIFT LOGIC FAILED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                .SBTTL  SCRATCH  AD TESTS
                                ;
                                        THE SCRATCH PAD TESTS ARE USED TO VERIFY THAT VARIOUS
                                ;DATA PATTERNS CAN BE SUCCESSFULLY HELD IN THE SCRATCH PAD
                                ;CIRCUITRY.  MOVE AND COMPARE INSTRUCTIONS ARE USED TO TEST THAT
                                ;R0 CAN HOLD VARIOUS DATA PATTERNS.  EACH DATA PATTERN IS
                                ;MOVED AND TESTED IN A SMALL LOOP CONVENIENT FOR SCOPING.  THE
                                ;SUCCESSFUL COMPLETION OF THESE TESTS SHOULD VERIFY THE CIRCUITRY EXTERNAL
                                ;TO THE SCRATCH PAD ITSELF.
                                        THE REMAINDER OF THE GENERAL REGISTERS ARE TESTED BY MOVING
                                ;A BIT INTO BIT 0 OF THE REGISTER AND SHIFTING IT LEFT ONE
                                ;BIT AT A TIME INTO THE CARRY BIT.  THE RESULT IS THEN CHECKED TO INSURE THAT
                                ;NO BITS WERE PICKED. THE PROCEDURE IS THEN REPEATED UNDER OPPOSITE
                                ;CONDITIONS. THE GENERAL REGISTER AND THE CARRY BIT ARE SET TO
                                ;ALL ONES, AND A ZERO IS SHIFTED LEFT FROM BIT 0 INTO THE CARRY BIT.
                                ;THE RESULT IS THEN CHECKED TO INSURE THAT NO ZEROES WERE PICKED.
                                        AT THIS POINT ALL OF THE GENERAL REGISTERS HAVE BEEN EXERCISED
                                ;AS WELL AS REGISTER 11.
                                ;
                                ;*******************************************************************************
                                ;TEST 13        TEST IF R0 CAN HOLD ALL ZEROES
                                ;*******************************************************************************
001642  005212                  TS13:   INC     (R2)            ;UPDATE TEST NUMBER
001644  022712  000013                  CMP     #13,(R2)        ;SEQUENCE ERROR?
001650  001004                          BNE     TS14-10         ;BR TO ERROR HALT ON SEQ ERROR

001652  012700  000000                  MOV     #0,R0           ;MOVE ZEROES TO R0
001656  005700                          TST     R0              ;SUCCESSFUL?
001660  001404                          BEQ     TS14
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                                ;           WHICH FOLLOWS W/ 773           <
001662  012742  000017                  MOV     #17,-(R2)       ;MOVE TO MAILBOX #  *******  17  *******
001666  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001670  000000                          HALT                    ;R0 NOT 0
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 14        TEST IF R0 CAN HOLD ONES AND ZEROES
                                ;*******************************************************************************
001672  005212                  TS14:   INC     (R2)            ;UPDATE TEST NUMBER
001674  022712  000014                  CMP     #14,(R2)        ;SEQUENCE ERROR?
001700  001005                          BNE     TS15-10         ;BR TO ERROR HALT ON SEQ ERROR
001702  012700  125252                  MOV     #125252,R0      ;MOVE ALTERNATING ONES AND ZEROES TO R0
001706  020027  125252                  CMP     R0,#125252      ;SUCCESSFUL?
```

```
001712  001404                          BEQ     TS15
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                        ;           CONDITIONAL BRANCH INST. AND   <==-
                                                        ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                        ;           WHICH FOLLOWS W/ 772           <
001714  012742  000020                  MOV     #20,-(R2)       ;MOVE TO MAILBOX #  *******  20  *******
001720  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001722  000000                          HALT                    ;R0 NOT 125252
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 15        TEST IF R0 CAN HOLD ZEROES AND ONES
                                ;*******************************************************************
001724  005212                  TS15:   INC     (R2)            ;UPDATE TEST NUMBER
001726  022712  000015                  CMP     #15,(R2)        ;SEQUENCE ERROR?
001732  001005                          BNE     TS16-10         ;BR TO ERROR HALT ON SEQ ERROR
001734  012700  052525                  MOV     #052525,R0      ;MOVE ALTERNATING ZEROES AND ONES TO R0
001740  020027  052525                  CMP     R0,#052525      ;SUCCESSFUL?
001744  001404                          BEQ     TS16
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 772           <
001746  012742  000021                  MOV     #21,-(R2)       ;MOVE TO MAILBOX #  *******  21  *******
001752  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
001754  000000                          HALT                    ;R0 NOT 52525
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 16        TEST IF R0 CAN HOLD ALL ONES
                                ;*******************************************************************
001756  005212                  TS16:   INC     (R2)            ;UPDATE TEST NUMBER
001760  022712  000016                  CMP     #16,(R2)        ;SEQUENCE ERROR?
001764  001005                          BNE     TS17-10         ;BR TO ERROR HALT ON SEQ ERROR
001766  012700  177777                  MOV     #177777,R0      ;MOVE ALL ONES TO R0
001772  020027  177777                  CMP     R0,#177777      ;SUCCESSFUL?
001776  001404                          BEQ     TS17
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 772           <
002000  012742  000022                  MOV     #22,-(R2)       ;MOVE TO MAILBOX #  *******  22  *******
002004  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002006  000000                          HALT                    ;R0 NOT 177777
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 17        TEST IF R1 CAN HOLD A ONE IN ALL BITS
                                ;*******************************************************************
002010  005212                  TS17:   INC     (R2)            ;UPDATE TEST NUMBER
002012  022712  000017                  CMP     #17,(R2)        ;SEQUENCE ERROR?
002016  001012                          BNE     TS20-10         ;BR TO ERROR HALT ON SEQ ERROR
002020  012701  000001                  MOV     #1,R1           ;SET BIT 0
002024  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002030  000241                          CLC                     ;CLEAR C-BIT
002032  005200                  REG1:   INC     R0              ;INCREMENT BIT COUNTER
```

```
002034  001403                  BEQ     REG1E           ;BR TO ERROR HALT IF BIT IS LOST
002036  006101                  ROL     R1              ;ROTATE 1 POSITION
002040  103374                  BCC     REG1            ;ALL DONE
002042  001404                  BEQ     TS20
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-- =
                                                        ;           CONDITIONAL BPANCH INST. AND    < ===
                                                        ;           REPLACE THE MOVE INSTRUCTION    <=-==
                                                        ;           WHICH FOLLOWS W/ 765            <====
002044                          REG1E:
002044  012742  000023                  MOV     #23,-(R2)       ;MOVE TO MAILBOX #  *******  23  *******
002050  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002052  000000                  HALT                    ;FAILURE WITH R1
                                                        ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 20        TEST IF R1 CAN HOLD A ZERO IN ALL BITS
                                ;*******************************************************************************
002054  005212                  TS20:   INC     (R2)            ;UPDATE TEST NUMBER
002056  022712  000020                  CMP     #20,(R2)        ;SEQUENCE ERROR?
002062  001014                  BNE     TS21-10         ;BR TO ERROR HALT ON SEQ ERROR
002064  012701  177776                  MOV     #-2,R1          ;SET ALL ONES IN R1 EXCEPT FOR BIT 0
002070  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002074  000261                  SEC                     ;SET C-BIT
002076  005200                  REG1A:  INC     R0              ;INCREMENT COUNTER
002100  001405                  BEQ     R1ERR           ;BR TO ERROR HALT IF COUNTER-0
002102  006101                  ROL     R1              ;ROTATE 1 POSITION
002104  103774                  BCS     REG1A           ;CONTINUE UNTIL C-BIT IS CLEAR
002106  022701  177777                  CMP     #-1,R1          ;CHECK DATA IN R1
002112  001404                  BEQ     TS21
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-= -
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 763            <====
002114                          R1ERR:
002114  012742  000024                  MOV     #24,-(R2)       ;MOVE TO MAILBOX #  *******  24  *******
002120  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002122  000000                  HALT                    ;FAILURE WITH R1
                                                        ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 21        TEST IF R2 CAN HOLD A ONE IN ALL BITS
                                ;*******************************************************************************
002124  005212                  TS21:   INC     (R2)            ;UPDATE TEST NUMBER
002126  022712  000021                  CMP     #21,(R2)        ;SEQUENCE ERROR?
002132  001012                  BNE     REG2A-14                ;BR TO ERROR HALT ON SEQ ERROR
002134  012702  000001                  MOV     #1,R2           ;SET BIT 0
002140  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002144  000241                  CLC                     ;CLEAR C-BIT
002146  005200                  REG2:   INC     R0              ;INCREMENT BIT COUNTER
002150  001403                  BEQ     REG2A-14        ;BR TO ERROR HALT IF BIT IS LOST
002152  006102                  ROL     R2              ;ROTATE 1 POSITION
002154  103374                  BCC     REG2            ;ALL DONE
002156  001406                  BEQ     REG2A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-- =-
                                                        ;           BRANCH INSTRUCTION AND          <=-=
                                                        ;           REPLACE THE MOVE INSTRUCTION    <-=
                                                        ;           FOLLOWING W/ 771                <
```

```
002160  012702  000304                  MOV     #$TESTN,R2      ;RESTORE POINTER
002164  012742  000025                  MOV     #25,-(R2)       ;MOVE TO MAILBOX #  *******  25  *******
002170  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002172  000000                          HALT                    ;FAILURE WITH R2
002174  012702  000304          REG2A:  MOV     #$TESTN,R2              ;RESTORE POINTER

                                ;*******************************************************************************
                                ;TEST 22        TEST IF R2 CAN HOLD A ZERO IN ALL BITS
                                ;*******************************************************************************
002200  005212                  TS22:   INC     (R2)            ;UPDATE TEST NUMBER
002202  022712  000022                  CMP     #22,(R2)        ;SEQUENCE ERROR?
002206  001020                          BNE     TS23-10         ;BR TO ERROR HALT ON SEQ ERROR
002210  012702  177776                  MOV     #-2,R2          ;SET ALL ONES IN R2 EXCEPT FOR BIT 0
002214  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002220  000261                          SEC                     ;SET C-BIT
002222  005200                  REG2B:  INC     R0              ;INCREMENT BIT COUNTER
002224  001407                          BEQ     R2ERR           ;BR TO ERROR HALT IF COUNTER-0
002226  006102                          ROL     R2              ;ROTATE 1 POSITION
002230  103774                          BCS     REG2B           ;CONTINUE UNTIL C-BIT IS CLEAR
002232  022702  177777                  CMP     #-1,R2          ;CHECK DATA IN R2
002236  001406                          BEQ     REG2C
002240  012702  000304                  MOV     #$TESTN,R2      ;RESTORE POINTER
002244                          R2ERR:
002244  012742  000026                  MOV     #26,-(R2)       ;MOVE TO MAILBOX #  *******  26  *******
002250  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002252  000000                          HALT                    ;FAILURE WITH R2
002254  012702  000304          REG2C:  MOV     #$TESTN,R2      ;RESTORE POINTER

                                ;*******************************************************************************
                                ;TEST 23        TEST IF R3 CAN HOLD A ONE IN ALL BITS
                                ;*******************************************************************************
002260  005212                  TS23:   INC     (R2)            ;UPDATE TEST NUMBER
002262  022712  000023                  CMP     #23,(R2)        ;SEQUENCE ERROR?
002266  001012                          BNE     TS24-10         ;BR TO ERROR HALT ON SEQ ERROR
002270  012703  000001                  MOV     #1,R3           ;SET BIT 0
002274  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002300  000241                          CLC                     ;CLEAR C-BIT
002302  005200                  REG3:   INC     R0              ;INCREMENT BIT COUNTER
002304  001403                          BEQ     REG3E           ;BR TO ERROR HALT IF BIT IS LOST
002306  006103                          ROL     R3              ;ROTATE 1 POSITION
002310  103374                          BCC     REG3            ;ALL DONE
002312  001404                          BEQ     TS24
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 765           <
002314                          REG3E:
002314  012742  000027                  MOV     #27,-(R2)       ;MOVE TO MAILBOX #  *******  27  *******
002320  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002322  000000                          HALT                    ;FAILURE WITH R3
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 24        TEST IF R3 CAN HOLD A ZERO IN ALL BITS
                                ;*******************************************************************************
002324  005212                  TS24:   INC     (R2)            ;UPDATE TEST NUMBER
```

```
002326  022712  000024                  CMP     #24,(R2)        ;SEQUENCE ERROR?
002332  001014                          BNE     TS25-10         ;BR TO ERROR HALT ON SEQ ERROR
002334  012703  177776                  MOV     #-2,R3          ;SET ALL ONES IN R3 EXCEPT FOR BIT 0
002340  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002344  000261                          SEC                     ;SET C-BIT
002346  005200                  REG3A:  INC     R0              ;INCREMENT BIT COUNTER
002350  001405                          BEQ     R3ERR           ;BR TO ERROR HALT IF COUNTER-0
002352  006103                          ROL     R3              ;ROTATE 1 POSITION
002354  103774                          BCS     REG3A           ;CONTINUE UNTIL C-BIT IS CLEAR
002356  022703  177777                  CMP     #-1,R3          ;CHECK DATA
002362  001404                          BEQ     TS25
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 763           <
002364                          R3ERR:
002364  012742  000030                  MOV     #30,-(R2)       ;MOVE TO MAILBOX #  *******  30  *******
002370  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002372  000000                          HALT                    ;FAILURE WITH R3
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;TEST 25        TEST IF R4 CAN HOLD A ONE IN ALL BITS
                                ;*******************************************************************
002374  005212                  TS25:   INC     (R2)            ;UPDATE TEST NUMBER
002376  022712  000025                  CMP     #25,(R2)        ;SEQUENCE ERROR?
002402  001012                          BNE     TS26-10         ;BR TO ERROR HALT ON SEQ ERROR
002404  012704  000001                  MOV     #1,R4           ;SET BIT 0
002410  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002414  000241                          CLC                     ;CLEAR C-BIT
002416  005200                  REG4:   INC     R0              ;INCREMENT BIT COUNTER
002420  001403                          BEQ     REG4E           ;BR TO ERROR HALT IF BIT IS LOST
002422  006104                          ROL     R4              ;ROTATE 1 POSITION
002424  103374                          BCC     REG4            ;ALL DONE
002426  001404                          BEQ     TS26
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 765           <
002430                          REG4E:
002430  012742  000031                  MOV     #31,-(R2)       ;MOVE TO MAILBOX #  *******  31  *******
002434  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002436  000000                          HALT                    ;FAILURE WITH R4
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;TEST 26        TEST IF R4 CAN HOLD A ZERO IN ALL BITS
                                ;*******************************************************************
002440  005212                  TS26:   INC     (R2)            ;UPDATE TEST NUMBER
002442  022712  000026                  CMP     #26,(R2)        ;SEQUENCE ERROR?
002446  001014                          BNE     TS27-10         ;BR TO ERROR HALT ON SEQ ERROR
002450  012704  177776                  MOV     #-2,R4          ;SET ALL ONES IN R4 EXCEPT FOR BIT 0
002454  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002460  000261                          SEC                     ;SET C-BIT
002462  005200                  REG4A:  INC     R0              ;INCREMENT BIT COUNTER
002464  001405                          BEQ     R4ERR           ;BR TO ERROR HALT IF COUNTER 0
```

```
002466  006104                          ROL     R4              ;ROTATE 1 POSITION
002470  103774                          BCS     REG4A           ;CONTINUE UNTIL C-BIT IS CLEAR
002472  022704  177777                  CMP     #-1,R4          ;CHECK DATA
002476  001404                          BEQ     TS27
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 763           <
002500                          R4ERR:
002500  012742  000032                  MOV     #32,-(R2)       ;MOVE TO MAILBOX #  *******  32  *******
002504  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002506  000000                          HALT                    ;FAILURE WITH R4
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 27        TEST IF R5 CAN HOLD A ONE IN ALL BITS
                                ;*******************************************************************
002510  005212                  TS27:   INC     (R2)            ;UPDATE TEST NUMBER
002512  022712  000027                  CMP     #27,(R2)        ;SEQUENCE ERROR?
002516  001012                          BNE     TS30-10         ;BR TO ERROR HALT ON SEQ ERROR
002520  012705  000001                  MOV     #1,R5           ;SET BIT 0
002524  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002530  000241                          CLC                     ;CLEAR C-BIT
002532  005200                  REG5:   INC     R0              ;INCREMENT BIT COUNTER
002534  001403                          BEQ     REG5E           ;BR TO ERROR HALT IF BIT IS LOST
002536  006105                          ROL     R5              ;ROTATE 1 POSITION
002540  103374                          BCC     REG5            ;ALL DONE
002542  001404                          BEQ     TS30
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 765           <
002544                          REG5E:
002544  012742  000033                  MOV     #33,-(R2)       ;MOVE TO MAILBOX #  *******  33  *******
002550  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002552  000000                          HALT                    ;FAILURE WITH R5
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 30        TEST IF R5 CAN HOLD A ZERO IN ALL BITS
                                ;*******************************************************************
002554  005212                  TS30    INC     (R2)            ;UPDATE TEST NUMBER
002556  022712  000030                  CMP     #30,(R2)        ;SEQUENCE ERROR?
002562  001014                          BNE     TS31-10         ;BR TO ERROR HALT ON SEQ ERROR
002564  012705  177776                  MOV     #-2,R5          ;SET ALL ONES IN R5 EXCEPT FOR BIT 0
002570  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002574  000261                          SEC                     ;SET C-BIT
002576  005200                  REG5A:  INC     R0              ;INCREMENT BIT COUNTER
002600  001405                          BEQ     R5ERR           ;BR TO ERROR HALT IF COUNTER 0
002602  006105                          ROL     R5              ;ROTATE 1 POSITION
002604  103774                          BCS     REG5A           ;CONTINUE UNTIL C-BIT IS CLEAR
002606  022705  177777                  CMP     #-1,R5          ;CHECK DATA
002612  001404                          BEQ     TS31
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
```

```
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 763           <====
002614                          R5ERR:
002614  012742  000034                  MOV     #34,-(R2)       ;MOVF TO MAILBOX #  *******  34  *******
002620  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002622  000000                          HALT                    ;FAILURE WITH R5
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 31        TEST IF R6 CAN HOLD A ONE IN ALL BITS
                                ;*******************************************************************************
002624  005212                  TS31:   INC     (R2)            ;UPDATE TEST NUMBER
002626  022712  000031                  CMP     #31,(R2)        ;SEQUENCE ERROR?
002632  001015                          BNE     TS32-10         ;BR TO ERROR HALT ON SEQ ERROR
002634  012767  000340  175134          MOV     #340,PS         ;LOCK OUT INTERRUPTS WHILE PLAYING WITH R6
002642  012706  000001                  MOV     #1,R6           ;SET BIT 0
002646  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002652  000241                          CLC                     ;CLEAR C-BIT
002654  005200                  REG6:   INC     R0              ;INCREMENT BIT COUNTER
002656  001403                          BEQ     REG6E           ;BR TO ERROR HALT IF BIT IS LOST
002660  006106                          ROL     R6              ;ROTATE 1 POSITION
002662  103374                          BCC     REG6            ;ALL DONE
002664  001404                          BEQ     TS32
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 762           <
002666                          REG6E:
002666  012742  000035                  MOV     #35,-(R2)       ;MOVE TO MAILBOX #  *******  35  *******
002672  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002674  000000                          HALT                    ;FAILURE WITH R6
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 32        TEST IF R6 CAN HOLD A ZERO IN ALL BITS
                                ;*******************************************************************************
002676  005212                  TS32:   INC     (R2)            ;UPDATE TEST NUMBER
002700  022712  000032                  CMP     #32,(R2)        ;SEQUENCE ERROR?
002704  001014                          BNE     TS33-10         ;BR TO ERROR HALT ON SEQ ERROR
002706  012706  177776                  MOV     #-2,R6          ;SET ALL ONES IN R6 EXCEPT FOR BIT 0
002712  012700  177757                  MOV     #-21,R0         ;SET BIT COUNTER
002716  000261                          SEC                     ;SET C-BIT
002720  005200                  REG6A:  INC     R0              ;INCREMENT BIT COUNT
002722  001405                          BEQ     R6ERR           ;BR TO ERROR HALT IF COUNTER 0
002724  006106                          ROL     R6              ;ROTATE 1 POSITION
002726  103774                          BCS     REG6A           ;CONTINUE UNTIL C-BIT IS CLEAR
002730  022706  177777                  CMP     #-1,R6          ;CHECK DATA
002734  001404                          BEQ     TS33
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 763           <
002736                          R6ERR:
002736  012742  000036                  MOV     #36,-(R2)       ;MOVE TO MAILBOX #  *******  36  *******
002742  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002744  000000                          HALT                    ;FAILURE WITH R6
```

```
                                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                .SBTTL  PSW TESTS
                                ;
                                ;       THE PSW TESTS ARE USED TO VERIFY THAT VARIOUS DATA
                                ;PATTERNS CAN BE SUCCESSFULLY HELD IN THE PSW AND THAT THE
                                ;PSW ADDRESSING LOGIC IS FUNCTIONING.  MOVE AND COMPARE INSTRUCTIONS
                                ;ARE USED TO TEST THAT THE PSW CAN HOLD VARIOUS DATA PATTERNS.
                                ;EACH DATA PATTERN IS MOVED AND TESTED IN A SMALL LOOP CONVENIENT FOR
                                ;SCOPING.
                                ;       THE PSW REGISTER IS TESTED, THE CC INPUTS ARE TESTED
                                ;LATER IN THE MICROCODE TESTS.  SETTING OF THE T-BIT BY THE
                                ;TEST PATTERNS IS PURPOSELY AVOIDED. TESTING OF THE
                                ;T-BIT TRAP CIRCUITRY IS LEFT FOR THE TRAP TEST.
                                ;
                                ;*******************************************************************
                                ;TEST 33        TEST IF PSW WILL HOLD ZEROES
                                ;*******************************************************************
002746  005212                  TS33:   INC     (R2)            ;UPDATE TEST NUMBER
002750  022712  000033                  CMP     #33,(R2)        ;SEQUENCE ERROR?
002754  001010                          BNE     TS34-10         ;BR TO ERROR HALT ON SEQ ERROR
002756  012706  001000                  MOV     #STBOT,R6
002762  012737  000000  177776          MOV     #0,@#PS         ;SET PSW TO ZERO
002770  005737  177776                  TST     @#PS            ;SUCCESSFUL
002774  001404                          BEQ     TS34
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 767           <
002776  012742  000037                  MOV     #37,-(R2)       ;MOVE TO MAILBOX #  *******  37  *******
003002  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003004  000000                          HALT                    ;PSW NOT 0
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 34        TEST IF PSW WILL HOLD ONES AND ZEROES
                                ;*******************************************************************
003006  005212                  TS34:   INC     (R2)            ;UPDATE TEST NUMBER
003010  022712  000034                  CMP     #34,(R2)        ;SEQUENCE ERROR?
003014  001007                          BNE     TS35-10         ;BR TO ERROR HALT ON SEQ ERROR
003016  012737  000252  177776          MOV     #252,@#PS       ;MOVE ALT. ONES AND ZEROES TO PSW
003024  023727  177776  000252          CMP     @#PS,#252       ;SUCCESSFUL?
003032  001404                          BEQ     TS35
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 770           <
003034  012742  000040                  MOV     #40,-(R2)       ;MOVE TO MAILBOX #  *******  40  *******
003040  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003042  000000                          HALT                    ;PSW NOT 252
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 35        TEST IF PSW (EXCEPT T-BIT) WILL HOLD ZEROES AND ONES
                                ;*******************************************************************
```

```
003044  005212                  TS35:   INC     (R2)            ;UPDATE TEST NUMBER
003046  022712  000035                  CMP     #35,(R2)        ;SEQUENCE ERROR?
003052  001007                          BNE     TS36-10         ;BR TO ERROR HALT ON SEQ ERROR
003054  012737  000105  177776          MOV     #105,@#PS       ;MOVE ALT. ONES AND ZEROES TO PSW
003062  023727  177776  000105          CMP     @#PS,#105       ;SUCCESSFUL?
003070  001404                          BEQ     TS36
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 770           <-
003072  012742  000041                  MOV     #41,-(R2)       ;MOVE TO MAILBOX #  *******  41  *******
003076  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003100  000000                          HALT                    ;PSW NOT 105
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 36        TEST IF PSW (EXCEPT T-BIT) WILL HOLD ALL ONES
                                ;*******************************************************************************
003102  005212                  TS36:   INC     (R2)            ;UPDATE TEST NUMBER
003104  022712  000036                  CMP     #36,(R2)        ;SEQUENCE ERROR?
003110  001007                          BNE     TS37-10         ;BR TO ERROR HALT ON SEQ ERROR
003112  012737  000357  177776          MOV     #357,@#PS       ;MOVE ONES TO PSW
003120  023727  177776  000357          CMP     @#PS,#357       ;SUCCESSFUL
003126  001404                          BEQ     TS37
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 770           <-
003130  012742  000042                  MOV     #42,-(R2)       ;MOVE TO MAILBOX #  *******  42  *******
003134  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003136  000000                          HALT                    ;PSW NOT 357
                                                                ;  OR SEQUENCE ERROR

                                .SBTTL  CONDITION CODE TEST

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST CHECKS THE CONDITIONAL BRANCHES INVOLVING THE Z-BIT.
                                ;THE Z-BIT IS SET WITH ALL OTHER CC BITS ZERO AND BOTH CONDITIONS
                                ;BEQ AND BNE ARE TESTED FOR PROPER EXECUTION.  THEN THE Z-BIT IS
                                ;SET WITH ALL OTHER CC BITS CLEAR AND BOTH CONDITIONS ARE TESTED
                                ;AGAIN FOR PROPER OPERATION.
                                ;       THIS TEST CHECKS THE OPERATION OF THE SET AND CLEAR CONDITION
                                ;CODE INSTRUCTIONS AND CHECKS THE CIRCUITRY EXTERNAL TO THE CONDITIONAL
                                ;BRANCH ROM.  THE BRANCH MICROCODE FOR ALTERING THE PC AND FOR
                                ;LEAVING THE PC UNALTERED IS TESTED.  ONLY THOSE ROM ADDRESSES SPECIFICALLY
                                ;USED IN THE TEST ARE VERIFIED HERE.
                                ;
                                ;*******************************************************************************
                                ;TEST 37        TEST BRANCHES AROUND Z-BIT
                                ;*******************************************************************************
003140  005212                  TS37:   INC     (R2)            ;UPDATE TEST NUMBER
003142  022712  000037                  CMP     #37,(R2)        ;SEQUENCE ERROR?
003146  001014                          BNE     TS40-10         ;BR TO ERROR HALT ON SEQ ERROR
                                        ;FIRST WITH Z-BIT ON
003150  000257                          CCC                     ;CC=0100: JUST Z-BIT
003152  000264                          SEZ
```

```
003154  001001                          BNE     BRZ1            ;CHECK OPPOSITE CONDITION
003156  001404                          BEQ     BRZ2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-==
                                                                ;           CONDITIONAL BRANCH INST. AND    <===-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-==
                                                                ;           WHICH FOLLOWS W/ 773            <---
003160                          BRZ1:
003160  012742  000043                  MOV     #43,-(R2)       ;MOVE TO MAILBOX #  *******  43  *******
003164  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003166  000000                          HALT                    ;IMPROPER BR W/ Z-1
                                        ;CHECK WITH Z-BIT OFF
003170  000277                  BRZ2:   SCC                     ;CC=1011: ALL BUT Z-BIT
003172  000244                          CLZ
003174  001401                          BEQ     BRZ3
003176  001004                          BNE     TS40
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=--=
                                                                ;           CONDITIONAL BRANCH INST. AND    <-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=---=
                                                                ;           WHICH FOLLOWS W/ 763            <-----
003200                          BRZ3:
003200  012742  000044                  MOV     #44,-(R2)       ;MOVE TO MAILBOX #  *******  44  *******
003204  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003206  000000                          HALT                    ;IMPROPER BR W/ Z=0
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST CHECKS THE CONDITIONAL BRANCHES INVOLVING THE N-BIT.
                                ;THE N-BIT IS SET WITH ALL OTHER CC BITS ZERO AND BOTH CONDITIONS
                                ;BMI AND BPL ARE TESTED FOR PROPER EXECUTION.  THEN THE N-BIT IS
                                ;SET WITH ALL OTHER CC BITS CLEAR AND BOTH CONDITIONS ARE TESTED
                                ;AGAIN FOR PROPER OPERATION.
                                ;       THIS TEST CHECKS THE OPERATION OF THE SET AND CLEAR CONDITION
                                ;CODE INSTRUCTIONS AND CHECKS THE CIRCUITRY EXTERNAL TO THE CONDITIONAL
                                ;BRANCH ROM.  THE BRANCH MICROCODE FOR ALTERING THE PC AND FOR
                                ;LEAVING THE PC UNALTERED IS TESTED.  ONLY THOSE ROM ADDRESSES SPECIFICALLY
                                ;USED IN THE TEST ARE VERIFIED HERE.
                                ;
                                ;*******************************************************************************
                                ;TEST 40        TEST BRANCHES AROUND N-BIT
                                ;*******************************************************************************
003210  005212                  TS40:   INC     (R2)            ;UPDATE TEST NUMBER
003212  022712  000040                  CMP     #40,(R2)        ;SEQUENCE ERROR?
003216  001014                          BNE     TS41-10         ;BR TO ERROR HALT ON SEQ ERROR
                                        ;FIRST WITH N-BIT ON
003220  000257                          CCC                     ;CC=1000: JUST N-BIT
003222  000270                          SEN
003224  100001                          BPL     BRN1            ;CHECK OPPOSITE CONDITION
003226  100404                          BMI     BRN2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-  -
                                                                ;           CONDITIONAL BRANCH INST. AND    <-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 773            <-
003230                          BRN1:
003230  012742  000045                  MOV     #45,-(R2)       ;MOVE TO MAILBOX #  *******  45  *******
003234  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
003236  000000                          HALT                    ;IMPROPER BR W/ N-1
                                        ;CHECK WITH N-BIT OFF
003240  000277                  BRN2.   SCC                     ;CC=0111
003242  000250                          CLN
003244  100401                          BMI     BRN3            ;CHECK OPPOSITE CONDITION
003246  100004                          BPL     TS41
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 763            <====
003250                          BRN3:
003250  012742  000046                  MOV     #46,-(R2)       ;MOVE TO MAILBOX #  *******  46  *******
003254  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003256  000000                          HALT                    ;IMPROPER BR W/ N=0
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                        THIS TEST CHECKS THE CONDITIONAL BRANCHES INVOLVING THE V-BIT.
                                ;THE V-BIT IS SET WITH ALL OTHER CC BITS ZERO AND BOTH CONDITIONS
                                ;BVS AND BVC ARE TESTED FOR PROPER EXECUTION.  THEN THE V-BIT IS
                                ;SET WITH ALL OTHER CC BITS CLEAR AND BOTH CONDITIONS ARE TESTED
                                ;AGAIN FOR PROPER OPERATION.
                                ;
                                ;*******************************************************************************
                                ;TEST 41        TEST BRANCHES AROUND V-BIT
                                ;*******************************************************************************
003260  005212                  TS41:   INC     (R2)            ;UPDATE TEST NUMBER
003262  022712  000041                  CMP     #41,(R2)        ;SEQUENCE ERROR?
003266  001014                          BNE     TS42-10         ;BR TO ERROR HALT ON SEQ ERROR
                                        ;FIRST WITH V-BIT ON
003270  000257                          CCC                     ;CC=0010: JUST V-BIT
003272  000262                          SEV
003274  102001                          BVC     BRV1            ;CHECK OPPOSITE CONDITION
003276  102404                          BVS     BRV2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 773            <====
003300                          BRV1:
003300  012742  000047                  MOV     #47,-(R2)       ;MOVE TO MAILBOX #  *******  47  *******
003304  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003306  000000                          HALT                    ;IMPROPER BR W/ V=1
                                        ;CHECK WITH V-BIT OFF
003310  000277                  BRV2:   SCC                     ;CC=1101: ALL BVT V-BIT
003312  000242                          CLV
003314  102401                          BVS     BRV3            ;CHECK OPPOSITE CONDITION
003316  102004                          BVC     TS42
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 763            <====
003320                          BRV3:
003320  012742  000050                  MOV     #50,-(R2)       ;MOVE TO MAILBOX #  *******  50  *******
003324  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003326  000000                          HALT                    ;IMPROPER BR W/ V 0
```

```
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST CHECKS THE CONDITIONAL BRANCHES INVOLVING THE C-BIT.
                                ;THE C-BIT IS SET WITH ALL OTHER CC BITS ZERO AND BOTH CONDITIONS
                                ;BCS AND BCC ARE TESTED FOR PROPER EXECUTION.  THEN THE C-BIT IS
                                ;SET WITH ALL OTHER CC BITS CLEAR AND BOTH CONDITIONS ARE TESTED
                                ;AGAIN FOR PROPER OPERATION.
                                ;
                                ;*******************************************************************************
                                ;TEST 42        TEST BRANCHES AROUND C-BIT
                                ;*******************************************************************************
003330  005212                  TS42:   INC     (R2)            ;UPDATE TEST NUMBER
003332  022712  000042                  CMP     #42,(R2)        ;SEQUENCE ERROR?
003336  001014                          BNE     TS43-10         ;BR TO ERROR HALT ON SEQ ERROR
                                        ;FIRST WITH C-BIT ON
003340  000257                          CCC                     ;CC=0001: JUST C-BIT
003342  000261                          SEC
003344  103001                          BCC     BRC1            ;CHECK OPPOSITE CONDITION
003346  103404                          BCS     BRC2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   < -
                                                                ;           WHICH FOLLOWS W/ 773           <=-
003350                          BRC1:
003350  012742  000051                  MOV     #51,-(R2)       ;MOVE TO MAILBOX #  *******  51  *******
003354  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003356  000000                          HALT                    ;IMPROPER BR W/ C-1
                                        ;CHECK WITH C-BIT OFF
003360  000277                  BRC2:   SCC                     ;CC=1110
003362  000241                          CLC
003364  103401                          BCS     BRC3            ;CHECK OPPOSITE CONDITION
003366  100404                          BMI     TS43
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   < -
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 763           <-
003370                          BRC3:
003370  012742  000052                  MOV     #52,-(R2)       ;MOVE TO MAILBOX #  *******  52  *******
003374  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003376  000000                          HALT                    ;IMPROPER BR W/ C=0
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                .SBTTL  MICROCODE TESTS
                                ;
                                ;       THE TEST EXERCISES  BRANCHES IN THE MICROCODE BY
                                ;TESTING AT LEAST ONE INSTRUCTION FROM EVERY CLASS OF INSTRUCTION IN
                                ;ALL POSSIBLE MODES.  FOR EXAMPLE, TO TEST THE SINGLE OPERAND INSTRUCTIONS,
                                ;AT LEAST ONE SINGLE OPERAND INSTRUCTION IS VERIFIED IN ALL UNIQUE
                                ;ADDRESSING MODES.  BYTE MODES ARE ALSO TESTED.  AS EACH NEW
                                ;MODE IS INTRODUCED THE SAME INSTRUCTION IS TRIED AND TESTED IN
                                ;A SMALL LOOP CONVENIENT FOR SCOPING.  THE TEST IS SET UP USING
                                ;ONLY INSTRUCTIONS AND ADDRESSING MODES WHICH HAVE BEEN PREVIOUSLY
                                ;VERIFIED.
```

```
                                        ;       IF THESE TESTS FAIL, CHECK THE RESULTS FOR A CLUE TO THE
                                        ;FAULT.
                                        ;
                                        ;*******************************************************************************
                                        ;*******************************************************************************
                                        ;
                                        ;       THE CLR INSTRUCTION IS USED TO INTRODUCE EACH ADDRESSING
                                        ;MODE WITH THE SINGLE OPERAND INSTRUCTION.  FOLLOWING THE SEQUENCE CHECK,
                                        ;THE CLR INSTRUCTION IS EXECUTED AND A BRANCH TEST IS EXECUTED WHICH
                                        ;CHECKS THAT THE Z-BIT WAS PROPERLY SET.  THIS TEST CAN CHECK IR DECODE
                                        ;AND MICROCODE FOR SOP INSTRUCTIONS WITH MODE 0.  FOLLOWING THIS TEST
                                        ;SEVERAL OTHER SOP INSTRUCTIONS ARE INTRODUCED WITH MODE 0.  THESE
                                        ;INSTRUCTIONS MAINPULATE DATA AND SERVE TO CHECK THE DATA RESULTS
                                        ;OF THE SOP INSTRUCTIONS IN THIS TEST.  THE DATA IN THIS TEST IS
                                        ;OPERATED ON BY EACH INSTRUCTION WITHOUT REINITIALIZING.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 43        TEST MODE 0 USING SOP INST.
                                        ;*******************************************************************************
003400  005212                          TS43:   INC     (R2)            ;UPDATE TEST NUMBER
003402  022712  000043                          CMP     #43,(R2)        ;SEQUENCE ERROR?
003406  001020                                  BNE     TS44-10         ;BR TO ERROR HALT ON SEQ ERROR
003410  005000                                  CLR     R0              ;TRY THE CLEAR INST.
003412  001404                                  BEQ     SOP0A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 775            <-
003414  012742  000053                          MOV     #53,-(R2)       ;MOVE TO MAILBOX #  *******  53  *******
003420  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003422  000000                                  HALT                    ;CLR DID NOT SET Z-BIT
003424  005200                          SOP0A:  INC     R0              ;TRY THE INCREMENT INST.
003426  005100                                  COM     R0              ;TRY COMPLEMENT
003430  005200                                  INC     R0
003432  100404                                  BMI     SOP0B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 765            <-
003434  012742  000054                          MOV     #54,-(R2)       ;MOVE TO MAILBOX #  *******  54  *******
003440  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003442  000000                                  HALT                    ;NEGATE DID NOT SET N-BIT
003444  005100                          SOP0B:  COM     R0              ;TRY COMPLEMENT INST.
003446  001404                                  BEQ     TS44
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <== -
                                                                        ;           CONDITIONAL BRANCH INST. AND    <== -
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 757            <====
003450  012742  000055                          MOV     #55,-(R2)       ;MOVE TO MAILBOX #  *******  55  *******
003454  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003456  000000                                  HALT                    ;CUMMULATIVE RESULT OF CLR,INC,NEG AND COM INSTS. FAILED
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST INTRODUCES THF REMAINING SOP INSTRUCIONS AND TESTS
                                        ;THEM IN MODE 0.  THE PURPOSE IS TO PROVIDE A BASELINE OF
                                        ;INSTRUCTIONS FOR USE IN THE SUBSEQUENT TESTS.  SINCE THE MICROCODE FOR
                                        ;THESE INSTRUCTIONS IS IDENTICAL TO THAT ALREADY TESTED, ANY TROUBLE
                                        ;SHOOTING EFFORTS SHOULD BE AIMED AT THE ACTUAL IR DECODE AND ALU
                                        ;FUNCTIONING.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 44        TEST REMAINDER OF SOP INSTS IN MODE 0
                                        ;*******************************************************************************
003460  005212                          TS44:   INC     (R2)            ;UPDATE TEST NUMBER
003462  022712  000044                          CMP     #44,(R2)        ;SEQUENCE ERROR?
003466  001021                                  BNE     TS45-10         ;BR TO ERROR HALT ON SEQ ERROR
003470  005000                                  CLR     R0              ;INITIALIZE
003472  005300                                  DEC     R0              ;TRY DECREMENT INST.
003474  100404                                  BMI     SOPOC
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <=-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 774           <
003476  012742  000056                          MOV     #56,-(R2)       ;MOVE TO MAILBOX #  *******  56  *******
003502  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003504  000000                                  HALT                    ;N-BIT NOT SET ON DEC
003506  000261                          SOPOC:  SEC                     ;INITIALIZE CARRY
003510  005500                                  ADC     R0              ;TRY ADD CARRY INST
003512  001007                                  BNE     SOPOD
003514  000261                                  SEC                     ;INITIALIZE CARRY
003516  005600                                  SBC     R0              ;TRY SUBTRACT-CARRY INST
003520  100004                                  BPL     SOPOD
003522  005100                                  COM     R0
003524  005200                                  INC     R0
003526  005300                                  DEC     R0
003530  001404                                  BEQ     TS45
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <=---
                                                                        ;           WHICH FOLLOWS W/ 756           <--
003532                                  SOPOD:
003532  012742  000057                          MOV     #57,-(R2)       ;MOVE TO MAILBOX #  *******  57  *******
003536  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003540  000000                                  HALT                    ; CUMMULATIVE RESULT OF ADC,SBC,COM,INC AND DEC INSTS. F
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST INTRODUCES THE BYTE CONTROL LOGIC OF THE PROCESSOR.
                                        ;THE MODE 0 BYTE MICROCODE IS TESTED.  THE METHOD AND SEQUENCE
                                        ;OF TESTING IS THE SAME AS THAT USED IN THE SOP MODE 0 TESTS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 45        TEST MODE 0 EVEN BYTE USING SOP INST
                                        ;*******************************************************************************
003542  005212                          TS45:   INC     (R2)            ;UPDATE TEST NUMBER
```

```
003544  022712  000045                CMP     #45,(R2)        ;SEQUENCE ERROR?
003550  001012                          BNE     TS46-10         ;BR TO ERROR HALT ON SEQ ERROR
003552  105000                          CLRB    R0              ;TRY CLEARING EVEN BYTE OF REGISTER
003554  001404                          BEQ     SOPB0A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 775           <====
003556  012742  000060                  MOV     #60,-(R2)       ;MOVE TO MAILBOX #  *******  60  *******
003562  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003564  000000                          HALT                    ;CLRB DID NOT SET Z-BIT
003566  105100                  SOPB0A: COMB    R0              ;TRY SETTING EVEN BYTE OF REGISTER
003570  100002                          BPL     SOPB0B
003572  105200                          INCB    R0              ;TRY INCREMENTING EVEN BYTE OF REGISTER>>
003574  001404                          BEQ     TS46
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 765           <====
003576                          SOPB0B:
003576  012742  000061                  MOV     #61,-(R2)       ;MOVE TO MAILBOX #  *******  61  *******
003602  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003604  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE BYTE INST.
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST USES THE CLR INSTRUCTION TO INTRODUCE AND TEST
                                ;SINGLE OPERAND MODE 1 INSTRUCTIONS.  AGAIN, THE CLR INSTRUCTION
                                ;IS USED TO INTRODUCE THE MICROCODE AND TO TEST THAT THE PROPER
                                ;CONDITION CODES ARE SET.  OTHER SOP INSTRUCTIONS ARE USED TO MANIPULATE
                                ;COMMON DATA TO VERIFY THAT THE CORRECT DATA IS PRODUCED.
                                ;
                                ;*******************************************************************************
                                ;TEST 46        TEST MODE 1 USING SOP INST.
                                ;*******************************************************************************
003606  005212                  TS46:   INC     (R2)            ;UPDATE TEST NUMBER
003610  022712  000046                  CMP     #46,(R2)        ;SEQUENCE ERROR?
003614  001014                          BNE     TS47-10         ;BR TO ERROR HALT ON SEQ ERROR
003616  005000                          CLR     R0              ;INITIALIZE R0
003620  005010                          CLR     (R0)            ;TRY CLEAR INST W/MODE 1
003622  001404                          BEQ     SOP1A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 774           <
003624  012742  000062                  MOV     #62,-(R2)       ;MOVE TO MAILBOX #  *******  62  *******
003630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003632  000000                          HALT                    ;CLR DID NOT SET Z-BIT
003634  005310                  SOP1A:  DEC     (R0)            ;TRY DECREMENT INST W/MODE 1
003636  100003                          BPL     SOP1B
003640  000261                          SEC                     ;INITIALIZE CARRY
003642  005510                          ADC     (R0)            ;TRY ADD-CARRY W/MODE 1
003644  001404                          BEQ     TS47
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
```

```
                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                        ;           WHICH FOLLOWS W/ 763           <=-
003646                          SOP1B:
003646  012742  000063                  MOV     #63,-(R2)       ;MOVE TO MAILBOX #  *******  63  *******
003652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003654  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE BYTE INSTRUCTION MICROCODE FOR MODE 1
                                ;SINGLE OPERAND INSTRUCTIONS.
                                ;       THIS IS THE FIRST PLACE THE SIGN EXTEND LOGIC IS EXERCISED
                                ;AND VERIFIED.
                                ;
                                ;*******************************************************************************
                                ;TEST 47        TEST MODE 1 EVEN BYTE USING SOP INST
                                ;*******************************************************************************
003656  005212                  TS47:   INC     (R2)            ;UPDATE TEST NUMBER
003660  022712  000047                  CMP     #47,(R2)        ;SEQUENCE ERROR?
003664  001020                          BNE     TS50-10         ;BR TO ERROR HALT ON SEQ ERROR
003666  005000                          CLR     R0              ;INITIALIZE R0
003670  005010                          CLR     (R0)            ;INITIALIZE LOC. 0
003672  005110                          COM     (R0)
003674  105010                          CLRB    (R0)            ;TRY TO CLEAR BYTE 0
003676  001404                          BEQ     SOPB1A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 772           <=
003700  012742  000064                  MOV     #64,-(R2)       ;MOVE TO MAILBOX #  *******  64  *******
003704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003706  000000                          HALT                    ;CLRB DID NOT SET Z-BIT
003710  005210                  SOPB1A: INC     (R0)            ;INCREMENT TO TEST WORD
003712  100005                          BPL     SOPB1B
003714  105110                          COMB    (R0)            ;COMPLEMENT:  ODD BYTE   376
003716  105210                          INCB    (R0)            ;INC:  ODD BYTE = 377
003720  100002                          BPL     SOPB1B
003722  105210                          INCB    (R0)            ;INCREMENT ODD BYTE=0
003724  001404                          BEQ     TS50
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 757           <
003726                          SOPB1B:
003726  012742  000065                  MOV     #65,-(R2)       ;MOVE TO MAILBOX #  *******  65  *******
003732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003734  000000                          HALT                    ;CHECK CUMMULATIVE RESULT OF ABOVE INST
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THAT SINGLE OPERAND BYTE INSTRUCTIONS WILL
                                ;FUNCTION CORRECTLY FOR ODD BYTES.
                                ;       THIS IS THE FIRST TIME THAT ADDRESS LINE 0 HAS BEEN
```

```
                                        ;EXERCISED.  CHECKS ARE MADE THAT THE PROPER BYTE IS MODIFIED AND
                                        ;THE CONDITION CODES ARE CHECKED.  IT IS ALSO VERIFIED THAT THE UNADDRESSED
                                        ;BYTE IS NOT ALTERED BY THE INSTRUCTION.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 50        TEST MODE 1 ODD BYTE USING SOP INST
                                        ;*******************************************************************************
                                        ;
003736  005212                          TS50:   INC     (R2)            ;UPDATE TEST NUMBER
003740  022712  000050                          CMP     #50,(R2)        ;SEQUENCE ERROR?
003744  001022                                  BNE     TS51-^O         ;BR TO ERROR HALT ON SEQ ERROR
003746  005000                                  CLR     R0              ;INITIALIZE R0
003750  005010                                  CLR     (R0)            ;INITIALIZE LOC. 0
003752  005110                                  COM     (R0)
003754  005200                                  INC     R0              ;R0=ODD BYTE
003756  105010                                  CLRB    (R0)            ;TRY TO CLEAR BYTE 1
003760  001404                                  BEQ     SOPB1C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 771            <
003762  012742  000066                          MOV     #66,-(R2)       ;MOVE TO MAILBOX #  *******  66  *******
003766  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003770  000000                                  HALT                    ;CLRB DID NOT SET Z-BIT
003772  005300                          SOPB1C: DEC     R0              ;R0=WORD ADDR.
003774  005210                                  INC     (R0)            ;INCREMENT TO TEST WORD
003776  005200                                  INC     R0              ;R0=ODD BYTE
004000  105110                                  COMB    (R0)            ;TRY TO COMPLEMENT BYTE 1
004002  105210                                  INCB    (R0)
004004  100002                                  BPL     SOPB1D
004006  105210                                  INCB    (R0)            ;TRY TO INCREMENT BYTE 1
004010  001404                                  BEQ     TS51
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 755            <-
004012                                  SOPB1D:
004012  012742  000067                          MOV     #67,-(R2)       ;MOVE TO MAILBOX #  *******  67  *******
004016  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004020  000000                                  HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST.
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 2 SINGLE-OPERAND INSTRUCTIONS.  PREVIOUSLY
                                        ;TESTED INSTRUCTIONS ARE USED TO SET A POINTER IN R0 TO LOC. 400.
                                        ;LOC. 400 IS INITIALIZED TO -1 BEFORE A CLR MODE 2 IS EXECUTED.
                                        ;       THEN R0 IS DECREMENTED BY TWO TO AGAIN POINT TO 400 BEFORE EACH
                                        ;OF SEVERAL MODE 2 INSTRUCTIONS ARE USED TO VERIFY THE DATA RESULTS OF
                                        ;THE TEST.  THIS PROCEDURE ALSO VERIFIES THE PROPER INCREMENTING OF THE
                                        ;REGISTER.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 51        TEST MODE 2 USING SOP INST.
                                        ;*******************************************************************************
004022  005212                          TS51:   INC     (R2)            ;UPDATE TEST NUMBER
004024  022712  000051                          CMP     #51,(R2)        ;SEQUENCE ERROR?
```

```
004030  001023                          BNE     TS52-10         ;BR TO ERROR HALT ON SEQ ERROR
004032  005000                          CLR     R0              ;SET R0=400
004034  105100                          COMB    R0
004036  005200                          INC     R0
004040  005010                          CLR     (R0)            ;CLEAR 400
004042  005110                          COM     (R0)            ;INITIALIZE: 400=-1
004044  005020                          CLR     (R0)+           ;TRY CLEARING WITH MODE 2
004046  001404                          BEQ     SOPZA
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 770           <====
004050  012742  000070                  MOV     #70,-(R2)       ;MOVE TO MAILBOX #  *******  70  *******
004054  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004056  000000                          HALT                    ;CLR INST DID NOT SET Z-BIT
004060  005300                  SOPZA:  DEC     R0              ;RESET R0
004062  005300                          DEC     R0
004064  005120                          COM     (R0)+           ;TRY COMPLEMENTING WITH MODE 2
004066  100004                          BPL     SOP2B
004070  005300                          DEC     R0              ;RESET R0
004072  005300                          DEC     R0
004074  005220                          INC     (R0)+           ;TRY INCREMENTING WITH MODE 2
004076  001404                          BEQ     TS52
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 754           <
004100                          SOP2B:
004100  012742  000071                  MOV     #71,-(R2)       ;MOVE TO MAILBOX #  *******  71  *******
004104  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004106  000000                          HALT                    ;CHECK CUMMULATIVE RESULT OF ABOVE INST
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 2 SINGLE OPERAND INSTRUCTIONS WHICH
                                ;ADDRESS EVEN BYTES.  R0 IS SET TO 400 AND USED TO INITIALIZE LOCATION
                                ;400 TO -1.  CLRB INSTRUCTION IS THEN EXECUTED ON BYTE 400 WITH
                                ;MODE 2.
                                ;       R0 IS THEN DECREMENTED BEFORE EACH OF SEVERAL MODE 2 INSTRUCTIONS
                                ;WHICH ARE USED TO VERIFY THE DATA RESULTS OF THE TEST.  THIS PROCEDURE ALSO
                                ;VERIFIES THE PROPER INCREMENTING OF THE REGISTER.
                                ;
                                ;*******************************************************************
                                ;TEST 52        TEST MODE 2 EVEN BYTE USING SOP INST.
                                ;*******************************************************************
004110  005212                  TS52:   INC     (R2)            ;UPDATE TEST NUMBER
004112  022712  000052                  CMP     #52,(R2)        ;SEQUENCE ERROR?
004116  001023                          BNE     TS53-10         ;BR TO ERROR HALT ON SEQ ERROR
004120  005000                          CLR     R0              ;SET R0=400
004122  105100                          COMB    R0
004124  005200                          INC     R0
004126  005010                          CLR     (R0)            ;CLEAR 400
004130  005110                          COM     (R0)            ;INITIALIZE: 400=-1
004132  105020                          CLRB    (R0)+           ;TRY TO CLEAT 400 W/MODE 2
004134  001404                          BEQ     SOPB2A
```

```
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=---=
                                                        ;           CONDITIONAL BRANCH INST. AND   <=---=
                                                        ;           REPLACE THE MOVE INSTRUCTION   <===
                                                        ;           WHICH FOLLOWS W/ 770           <=--
004136  012742  000072          MOV     #72,-(R2)       ;MOVE TO MAILBOX #  *******  72  *******
004142  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004144  000000                  HALT                    ;CLR DID NOT SET Z-BIT
004146  005300          SOPB2A: DEC     R0              ;RESULT R0=400
004150  005210                  INC     (R0)            ;INC 400 TO TEST WORD
004152  105110                  COMB    (R0)
004154  105220                  INCB    (R0)+           ;TRY TO INC EVEN BYTE
004156  100003                  BPL     SOPB2B
004160  005300                  DEC     R0              ;RESET R0=400
004162  105220                  INCB    (R0)+           ;TRY INCREMENT OF EVEN BYTE
004164  001404                  BEQ     TS53
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 754           <
004166                  SOPB2B:
004166  012742  000073          MOV     #73,-(R2)       ;MOVE TO MAILBOX #  *******  73  *******
004172  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004174  000000                  HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST.
                                                        ;  OR SEQUENCE ERROR

                        ;*******************************************************************************
                        ;
                        ;       THIS TEST FOLLOWS THE SAME PROCEDURE DESCRIBED IN THE PREVIOUS
                        ;TEST.  HERE, THE BYTE INSTRUCTION IS USED TO ADDRESS AN ODD BYTE.
                        ;
                        ;*******************************************************************************
                        ;TEST 53        TEST MODE 2 ODD BYTE USING SOP INST.
                        ;*******************************************************************************
004176  005212          TS53:   INC     (R2)            ;UPDATE TEST NUMBER
004200  022712  000053          CMP     #53,(R2)        ;SEQUENCE ERROR?
004204  001026                  BNE     TS54-10         ;BR TO ERROR HALT ON SEQ ERROR
004206  005000                  CLR     R0              ;SET R0=400
004210  105100                  COMB    R0
004212  005200                  INC     R0
004214  005010                  CLR     (R0)            ;CLEAR LOC 400
004216  005110                  COM     (R0)            ;INITIALIZE: 400 -1
004220  005200                  INC     R0              ;R0=ODD BYTE
004222  105020                  CLRB    (R0)+           ;TRY TO CLEAR ODD BYTE
004224  001404                  BEQ     SOPB2C
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <=---=
                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                        ;           WHICH FOLLOWS W/ 767           <---
004226  012742  000074          MOV     #74,-(R2)       ;MOVE TO MAILBOX #  *******  74  *******
004232  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004234  000000                  HALT                    ;CLRB DID NOT SET Z-BIT
004236  005300          SOPB2C: DEC     R0              ;R0=WORD ADDR.
004240  005300                  DEC     R0
004242  005220                  INC     (R0)+           ;INCREMENT WORD
004244  005300                  DEC     R0              ;POINT TO ODD BYTE
004246  105110                  COMB    (R0)            ;COMPLEMENT ODD BYTE
```

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004250  105220                          INCB    (R0)+           ;TRY TO INCREMENT ODD BYTE
004252  100003                          BPL     SOPB2D
004254  005300                          DEC     R0              ;RESET R0 TO ODD BYTE
004256  105220                          INCB    (R0)+           ;TRY TO INCREMENT ODD BYTE
004260  001404                          BEQ     TS54
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-==
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 751            <- -
004262                          SOPB2D:
004262  012742  000075                  MOV     #75,-(R2)       ;MOVE TO MAILBOX #  *******  75  *******
004266  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004270  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST.
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THESE TESTS CHECK THE NEGATE INSTRUCTION IN ALL MODES.  PREVIOUSLY
                                ;TESTED SINGLE-OPERAND INSTRUCTIONS ARE USED TO TEST THE NEGATE INSTRUCTION.
                                ;
                                ;*******************************************************************************
                                ;TEST 54        TEST MODE 0 USING NEGATE INSTRUCTION
                                ;*******************************************************************************
004272  005212                  TS54:   INC     (R2)            ;UPDATE TEST NUMBER
004274  022712  000054                  CMP     #54,(R2)        ;SEQUENCE ERROR?
004300  001035                          BNE     TS55-10         ;BR TO ERROR HALT ON SEQ ERROR
004302  005000                          CLR     R0              ;SET R0=0
004304  005200                          INC     R0              ;     R0=1
004306  005400                          NEG     R0              ;TRY NEGATE MODE 0:  R0--1
004310  100003                          BPL     NEG00           ;CC=1001?
004312  001402                          BEQ     NEG00
004314  102401                          BVS     NEG00
004316  103404                          BCS     NEG01
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 770            <
004320                          NEG00:
004320  012742  000076                  MOV     #76,-(R2)       ;MOVE TO MAILBOX #  *******  76  *******
004324  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004326  000000                          HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY

004330  005200                  NEG01:  INC     R0              ;TEST DA ` RESULT
004332  001404                          BEQ     NEG02
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    < -
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 762            <
004334  012742  000077                  MOV     #77,-(R2)       ;MOVE TO MAILBOX #  *******  77  *******
004340  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004342  000000                          HALT                    ;DATA RESULT OF NEGATE INCORRECT

004344  105100                  NEG02:  COMB    R0              ;R0=377
004346  105400                          NEGB    R0              ;R0=1
004350  100403                          BMI     NEG03           ;CC=0001?
004352  001402                          BEQ     NEG03
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```
004354  102401                          BVS     NEG03
004356  103404                          BCS     NEG04
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 750            <====
004360                          NEG03:
004360  012742  000100                  MOV     #100,-(R2)      ;MOVE TO MAILBOX #  *******  100  *******
004364  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004366  000000                          HALT                    ;NEGB DID NOT SET CC'S CORRECTLY
004370  005300                  NEG04:  DEC     R0              ;TEST DATA RESULT
004372  001404                          BEQ     TS55
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 742            <====
004374  012742  000101                  MOV     #101,-(R2)      ;MOVE TO MAILBOX #  *******  101  *******
004400  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004402  000000                          HALT                    ;DATA RESULT OF NEGB INCORRECT
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 55        TEST MODE 1 USING NEGATE INST.
                                ;*******************************************************************
004404  005212                  TS55:   INC     (R2)            ;UPDATE TEST NUMBER
004406  022712  000055                  CMP     #55,(R2)        ;SEQUENCE ERROR?
004412  001040                          BNE     TS56-10         ;BR TO ERROR HALT ON SEQ ERROR
004414  005000                          CLR     R0              ;POINT TO LOC. 0
004416  005010                          CLR     (R0)            ;CLEAR LOC. 0
004420  005210                          INC     (R0)            ;LOC. 0=1
004422  005410                          NEG     (R0)            ;TRY NEG. LOC. 0=-1
004424  100003                          BPL     NEG10           ;CC=1001
004426  001402                          BEQ     NEG10
004430  102401                          BVS     NEG10
004432  103404                          BCS     NEG11
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                        ;           CONDITIONAL BRANCH INST. AND    <=-
                                                        ;           REPLACE THE MOVE INSTRUCTION    < -
                                                        ;           WHICH FOLLOWS W/ 767            <
004434                          NEG10:
004434  012742  000102                  MOV     #102,-(R2)      ;MOVE TO MAILBOX #  *******  102  *******
004440  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004442  000000                          HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY

004444  005237  000000          NEG11:  INC     @#0             ;TEST DATA RESULT
004450  001404                          BEQ     NEG12
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                        ;           CONDITIONAL BRANCH INST. AND    < -=
                                                        ;           REPLACE THE MOVE INSTRUCTION    <-=--
                                                        ;           WHICH FOLLOWS W/ 760            <-
004452  012742  000103                  MOV     #103,-(R2)      ;MOVE TO MAILBOX #  *******  103  *******
004456  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004460  000000                          HALT                    ;DATA RESULT OF NEGATE INCORRECT
004462  105110                  NEG12:  COMB    (R0)            ;LOC. 0=377
004464  105410                          NEGB    (R0)            ;TRY NEGB LOC. 0=1
004466  100403                          BMI     NEG13           ;CC=0001?
004470  001402                          BEQ     NEG13
```

```
004472  102401                          BVS     NEG13
004474  103404                          BCS     NEG14
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 746            <====
004476                          NEG13:
004476  012742  000104                  MOV     #104,-(R2)      ;MOVE TO MAILBOX #  *******  104  *******
004502  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004504  000000                          HALT                    ;NEGB DID NOT SET CC'S CORRECTLY
004506  005337  000000          NEG14:  DEC     @#0             ;TEST DATA RESULT
004512  001404                          BEQ     TS56
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 737            <====
004514  012742  000105                  MOV     #105,-(R2)      ;MOVE TO MAILBOX #  *******  105  *******
004520  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004522  000000                          HALT                    ;DATA RESULT OF NEGB INCORRECT
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 56        TEST MODE 2 USING NEGATE INSTRUCTION
                                ;*******************************************************************************
004524  005212                  TS56:   INC     (R2)            ;UPDATE TEST NUMBER
004526  022712  000056                  CMP     #56,(R2)        ;SEQUENCE ERROR?
004532  001032                          BNE     TS57-10         ;BR TO ERROR HALT ON SEQ ERROR
004534  005000                          CLR     R0              ;POINT TO LOC. 0
004536  005010                          CLR     (R0)            ;CLEAR LOC. 0
004540  005210                          INC     (R0)            ;LOC. 0-1
004542  005420                          NEG     (R0)+           ;TRY NEG.: LOC. 0=-1
004544  100003                          BPL     NEG20           ;CC=1001?
004546  001402                          BEQ     NEG20
004550  102401                          BVS     NEG20
004552  103404                          BCS     NEG21
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                        ;           REPLACE THE MOVE INSTRUCTION    <==
                                                        ;           WHICH FOLLOWS W/ 767            <=
004554                          NEG20:
004554  012742  000106                  MOV     #106,-(R2)      ;MOVE TO MAILBOX #  *******  106  *******
004560  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004562  000000                          HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY
004564  105300                  NEG21:  DECB    R0              ;R0=LOC. 0
004566  105300                          DECB    R0
004570  105420                          NEGB    (R0)+           ;BYTE 0-1   R0=1
004572  105420                          NEGB    (R0)+           ;BYTE 1=1   R0=2
004574  105340                          DECB    -(R0)           ;R0=1  LOC. 0=01
004576  005300                          DEC     R0              ;R0=0
004600  001404                          BEQ     NEG22
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===
                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                        ;           REPLACE THE MOVE INSTRUCTION    <===
                                                        ;           WHICH FOLLOWS W/ 754            <
004602  012742  000107                  MOV     #107,-(R2)      ;MOVE TO MAILBOX #  *******  107  *******
004606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004610  000000                          HALT                    ;REGISTER NOT INCREMENTED CORRECTLY
```

```
004612  005337  000000          NEG22:  DEC     @#0             ;LOC. 0=0
004616  001404                          BEQ     TS57
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <----=
                                                                ;           WHICH FOLLOWS W/ 745            < ===
004620  012742  000110                  MOV     #110,-(R2)      ;MOVE TO MAILBOX #  *******  110  *******
004624  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004626  000000                          HALT                    ;NEG BYTE INSTRUCTIONS FAILED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 3 SINGLE OPERAND INSTRUCTIONS.  IT
                                ;USES LOCATION 0 AS ITS TARGET DATA.  A TABLE LOCATED AT LOC. 400
                                ;THRU 402 IS USED TO SUPPLY THE ADDRESS OF LOCATION 0 TO THE
                                ;INSTRUCTIONS UNDER TEST.
                                ;       R0 IS SET TO 400, THE START OF THE ADDRESS TABLE, AND A CLR
                                ;INSTRUCTION IS EXECUTED WITH MODE 3 TO CLEAR LOC. 0.  THEN R0
                                ;IS DECREMENTED BY TWO AND TWO OTHER MODE 3 INSTRUCTIONS OPERATE ON
                                ;LOC. 0 TO VERIFY THE DATA RESULTS OF THE TEST.  THE PROPER INCREMENTING
                                ;OF THE REGISTER IS ALSO VERIFIED IN THIS MANNER.
                                ;       IF A FAILURE IS DETECTED BE SURE TO VERIFY THAT THE TABLE
                                ;(LOC. 400-402) HAS THE PROPER VALUES (0).
                                ;
                                ;*******************************************************************************
                                ;TEST 57        TEST MODE 3 USING SOP INST.
                                ;*******************************************************************************
004630  005212                  TS57:   INC     (R2)            ;UPDATE TEST NUMBER
004632  022712  000057                  CMP     #57,(R2)        ;SEQUENCE ERROR?
004636  001020                          BNE     TS60-10         ;BR TO ERROR HALT ON SEQ ERROR
004640  005000                          CLR     R0              ;SET R0=400
004642  105100                          COMB    R0
004644  005200                          INC     R0
004646  005010                          CLR     (R0)            ;CLEAR LOC 400
004650  005030                          CLR     @(R0)+          ;TRY TO CLEAR LOC 0 USING MODE 3 ;R0 402
004652  001404                          BEQ     SOP3A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 771            <
004654  012742  000111                  MOV     #111,-(R2)      ;MOVE TO MAILBOX #  *******  111  *******
004660  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004662  000000                          HALT                    ;CLR DID NOT SET Z-BIT
004664  005300                  SOP3A:  DEC     R0              ;RESET R0=400
004666  005300                          DEC     R0
004670  005130                          COM     @(R0)+          ;TRY TO COMPLEMENT LOC 0 OF MODE 3  ;R0=402
004672  100002                          BPL     SOP3B
004674  005230                          INC     @(R0)+          ;TRY TO INCREMENT LOC 0 W/MODE 3  ;R0-404
004676  001404                          BEQ     TS60
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-=
                                                                ;           CONDITIONAL BRANCH INST. AND    <  - -
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 757            <  =
004700                          SOP3B:
004700  012742  000112                  MOV     #112,-(R2)      ;MOVE TO MAILBOX #  *******  112  *******
```

```
004704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004706  000000                          HALT                    ;CUMMULATIVE RESULT OF ABOVE INST FAILED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 3 SINGLE OPERAND BYTE INSTRUCTIONS
                                ;WHICH ADDRESS EVEN BYTES.  AGAIN, THE TARGET LOCATION 0 IS USED
                                ;AND THE SAME TABLE AT 400 IS EMPLOYED.
                                ;       AFTER POINTING R4 TO THE TABLE (400) AND SETTING LOCATION
                                ;0 TO -1, A CLRB INSTRUCTION IS USED TO CLEAR BYTE 0.
                                ;       SEVERAL OTHER MODE 3 INSTRUCTIONS ARE THEN USED WITH THE TABLE
                                ;TO VERIFY THE DATA RESULTS AND THE PROPER INCREMENTING OF THE REGISTER.
                                ;IF A FAILURE IS DETECTED, BE SURE THAT THE TABLE (LOCATION 400-402) HAS
                                ;THE PROPER VALUES (0).
                                ;
                                ;*******************************************************************
                                ;TEST 60        TEST MODE 3 EVEN BYTE USING SOP INST.
                                ;*******************************************************************
004710  005212                  TS60:   INC     (R2)            ;UPDATE TEST NUMBER
004712  022712  000060                  CMP     #60,(R2)        ;SEQUENCE ERROR?
004716  001026                          BNE     TS61-10         ;BR TO ERROR HALT ON SEQ ERROR
004720  005004                          CLR     R4              ;SET R4=400
004722  105104                          COMB    R4
004724  005204                          INC     R4
004726  005000                          CLR     R0              ;INITIALIZE LOC. 0=-1
004730  005010                          CLR     (R0)
004732  005110                          COM     (R0)            ;LOC. 0=-1
004734  105034                          CLRB    @(R4)+          ;TRY TO CLEAR EVEN BYTE ,LOC. 0-177400  R4-402
004736  001404                          BEQ     SOPB3A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   < -
                                                                ;           CONDITIONAL BRANCH INST. AND   < -
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 767           <-
004740  012742  000113                  MOV     #113,-(R2)      ;MOVE TO MAILBOX #  *******  113  *******
004744  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004746  000000                          HALT                    ;CLRB DID NOT SET Z-BIT
004750  005304                  SOPB3A: DEC     R4              ;RESET POINTER  R4=400
004752  005304                          DEC     R4
004754  005234                          INC     @(R4)+          ;TRY INCREMENTING WORD  LOC.0=177401  R4=402
004756  100006                          BPL     SOPB3B
004760  105434                          NEGB    @(R4)+          ;TRY TO NEGATE EVEN BYTE ;LOC.0--1 R4-404
004762  100004                          BPL     SOPB3B
004764  005304                          DEC     R4              ;R4=402
004766  005304                          DEC     R4
004770  105234                          INCB    @(R4)+          ;TRY TO INCREMENT EVEN BYTE ;LOC. 0=17400
004772  001404                          BEQ     TS61
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <==-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=-=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <==-
                                                                ;           WHICH FOLLOWS W/ 751           <=-=
004774                          SOPB3B:
004774  012742  000114                  MOV     #114,-(R2)      ;MOVE TO MAILBOX #  *******  114  *******
005000  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005002  000000                          HALT                    ;CUMMULATIVE RESULT OF ABOVE INST FAILED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 3 SINGLE OPERAND BYTE INSTRUCTIONS
                                        ;WHICH ADDRESS ODD BYTES.  THE TARGET IS BYTE 1.  A TABLE AT
                                        ;LOC. 400-406 IS USED.  R0 SERVES AS THE TABLE POINTER.
                                        ;       R0 IS INITIALIZED TO 400.  LOC. 0 IS SET TO -1 USING THE
                                        ;FIRST TWO TABLE ENTRIES.  A CLRB MODE 3 IS EXECUTED ON BYTE 1 USING
                                        ;TABLE ADDRESS AT 404.  R0 IS DECREMENTED TO 402 AND SEVERAL SOP
                                        ;MODE 3 INSTRUCTIONS ARE USED TO VERIFY DATA RESULTS AND PROPER
                                        ;REGISTER INCREMENTING.
                                        ;       THE TABLE (400-406) SHOULD CONTAIN 0,0,1,1 BEFORE AND
                                        ;AFTER THE TEST IS RUN.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 61        TEST MODE 3 ODD BYTE USING SOP INST.
                                        ;*******************************************************************************
005004  005212                          TS61:   INC     (R2)            ;UPDATE TEST NUMBER
005006  022712  000061                          CMP     #61,(R2)        ;SEQUENCE ERROR?
005012  001024                                  BNE     TS62-10         ;BR TO ERROR HALT ON SEQ ERROR
005014  005000                                  CLR     R0              ;SET R0=400
005016  105100                                  COMB    R0
005020  005200                                  INC     R0
005022  005030                                  CLR     @(R0)+          ;INITIALIZE
005024  005130                                  COM     @(R0)+          ;LOC 0=-1 R0=404
005026  105030                                  CLRB    @(R0)+          ;TRY TO CLEAR ODD BYTE LOC. 0=377 R0=406
005030  001404                                  BEQ     SOPB3C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 770           <====
005032  012742  000115                          MOV     #115,-(R2)      ;MOVE TO MAILBOX #  *******  115  *******
005036  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005040  000000                                  HALT                    ;CLRB DID NOT SET Z-BIT
005042  005300                          SOPB3C: DEC     R0              ;RESET R0=402
005044  005300                                  DEC     R0
005046  005300                                  DEC     R0              ;POINT TO EVEN BYTE ADDR.
005050  005300                                  DEC     R0
005052  005230                                  INC     @(R0)+          ;INCREMENT WORD LOC. 0=400 R0-404
005054  105430                                  NEGB    @(R0)+          ;TRY TO NEGATE ODD BYTE LOC. 0-177400 R0=406
005056  100002                                  BPL     SOPB3D
005060  105230                                  INCB    @(R0)+          ;TRY TO INCREMENT ODD BYTE LOC.0=0 R0=410
005062  001404                                  BEQ     TS62
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-=
                                                                        ;           CONDITIONAL BRANCH INST. AND   <=- -
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <=- =
                                                                        ;           WHICH FOLLOWS W/ 753           <=-=
005064                                  SOPB3D:
005064  012742  000116                          MOV     #116,-(R2)      ;MOVE TO MAILBOX #  *******  116  *******
005070  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005072  000000                                  HALT                    ;CUMMULATIVE RESULT OF ABOVE INSTS FAILED
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;TEST 62        TEST MODE 3 USING NEGATE INSTRUCTION
                                        ;*******************************************************************************
005074  005212                          TS62:   INC     (R2)            ;UPDATE TEST NUMBER
```

```
005076  022712  000062                  CMP     #62,(R2)        ;SEQUENCE ERROR?
005102  001054                          BNE     TS63-10         ;BR TO ERROR HALT ON SEQ ERROR
005104  005000                          CLR     R0              ;R0=400
005106  105100                          COMB    R0
005110  005200                          INC     R0
005112  005010                          CLR     (R0)            ;LOC. 400=0
005114  005004                          CLR     R4              ;R4=0
005116  005014                          CLR     (R4)            ;LOC. 0=0
005120  005214                          INC     (R4)            ;LOC. 0=1
005122  005430                          NEG     @(R0)+          ;TRY NEGATE   LOC. 0=-1  R0-402
005124  100003                          BPL     NEG30           ;CC=1001?
005126  001402                          BEQ     NEG30
005130  102401                          BVS     NEG30
005132  103404                          BCS     NEG31
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===-=
                                                                ;           CONDITIONAL BRANCH INST. AND    <=- =
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-=-=
                                                                ;           WHICH FOLLOWS W/ 763            <--=
005134                          NEG30:
005134  012742  000117                  MOV     #117,-(R2)      ;MOVE TO MAILBOX #  *******  117  *******
005140  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005142  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
005144  005214                  NEG31:  INC     (R4)            ;LOC. 0=0
005146  001404                          BEQ     NEG32
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=---
                                                                ;           CONDITIONAL BRANCH INST. AND    <=  -
                                                                ;           REPLACE THE MOVE INSTRUCTION    <----
                                                                ;           WHICH FOLLOWS W/ 755            <  -
005150  012742  000120                  MOV     #120,-(R2)      ;MOVE TO MAILBOX #  *******  120  *******
005154  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005156  000000                          HALT                    ;DATA RESULT OF NEG INCORRECT
005160  105137  000001          NEG32:  COMB    @#1             ;LOC 0=177400
005164  005237  000000                  INC     @#0             ;LOC. 0=177401
005170  105430                          NEGB    @(R0)+          ;TRY NEGB LOC. 0=177777  R0-404
005172  100404                          BMI     NEG33
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    < =-
                                                                ;           CONDITIONAL BRANCH INST. AND    <  -
                                                                ;           REPLACE THE MOVE INSTRUCTION    < -=-
                                                                ;           WHICH FOLLOWS W/ 743            <  --
005174  012742  000121                  MOV     #121,-(R2)      ;MOVE TO MAILBOX #  *******  121  *******
005200  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005202  000000                          HALT                    ;NEGB FAILED WITH EVEN BYTE
005204  105430                  NEG33:  NEGB    @(R0)+          ;TRY NEGB  LOC.0=777  R0=406
005206  100004                          BPL     NEG34
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=---
                                                                ;           CONDITIONAL BRANCH INST. AND    <==--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-=-=
                                                                ;           WHICH FOLLOWS W/ 735            <==-
005210  012742  000122                  MOV     #122,-(R2)      ;MOVE TO MAILBOX #  *******  122  *******
005214  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005216  000000                          HALT                    ;NEGB FAILED WITH ODD BYTE
005220  105137  000001          NEG34:  COMB    @#1             ;LOC. 0=177377
005224  105237  000001                  INCB    @#1             ;LOC. 0=177777
005230  005214                          INC     (R4)            ;LOC. 0=0
005232  001404                          BEQ     TS63
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

```
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 723           <====
005234  012742  000123                  MOV     #123,-(R2)      ;MOVE TO MAILBOX #  *******  123  *******
005240  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005242  000000                          HALT                    ;DATA RESULT OF NEGB'S INCORRECT
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 4 SINGLE OPERAND INSTRUCTIONS.
                                ;R0 IS SET TO 400. A CLR INSTRUCTION IS EXECUTED IN MODE 4 TO CLEAR
```

```
                                        ;LOC. 376. R0 IS RESET TO 400 AND A COM INSTRUCTION USING MODE 4
                                        ;COMPLEMENTS LOC.376.
                                        ;       TWO INC INSTRUCTIONS AND A MODE 4 INSTRUCTION ARE EXECUTED
                                        ;TO COMPLETE THE TEST.
                                        ;*******************************************************************
                                        ;TEST 63        TEST MODE 4 USING SOP INSTS
                                        ;*******************************************************************
005244  005212                          TS63:   INC     (R2)            ;UPDATE TEST NUMBER
005246  022712  000063                          CMP     #63,(R2)        ;SEQUENCE ERROR?
005252  001021                                  BNE     TS64-10         ;BR TO ERROR HALT ON SEQ ERROR
005254  005000                                  CLR     R0              ;SET R0-400
005256  105100                                  COMB    R0
005260  005200                                  INC     R0
005262  005040                                  CLR     -(R0)           ;TRY TO CLEAR USING MODE 4
005264  001404                                  BEQ     SOP4A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 772           <
005266  012742  000124                          MOV     #124,-(R2)      ;MOVE TO MAILBOX #  *******  124  *******
005272  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005274  000000                                  HALT                    ;CLR DID NOT SET Z-BIT
005276  005200                          SOP4A:  INC     R0              ;RESET R0
005300  005200                                  INC     R0
005302  005140                                  COM     -(R0)           ;TRY TO COMPLEMENT USING MODE 4
005304  100004                                  BPL     SOP4B
005306  005200                                  INC     R0              ;MOVE POINTER
005310  005200                                  INC     R0
005312  005240                                  INC     -(R0)
005314  001404                                  BEQ     TS64
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 756           <-
005316                                  SOP4B:
005316  012742  000125                          MOV     #125,-(R2)      ;MOVE TO MAILBOX #  *******  125  *******
005322  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005324  000000                                  HALT                    ;CHECK CUMMULATIVE RESULT OF ABOVE INST.
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 5 SINGLE OPERAND INSTRUCTIONS.  IT
                                        ;USES LOCATION 0 AS ITS TARGET DATA.  A TABLE LOCATED AT LOC. 372
                                        ;THRU 374 IS USED TO SUPPLY THE ADDRESS OF LOCATION 0 TO THE
                                        ;INSTRUCTIONS UNDER TEST.
                                        ;       R0 IS SET TO 376, (THE START OF THE ADDRESS TABLE) +2,
                                        ;AND A CLR INSTRUCTION IS EXECUTED WITH MODE 3 TO CLEAR
                                        ;LOC. 0.  THEN R0 IS INCREMENTED BY TWO AND TWO OTHER MODE 3
                                        ;INSTRUCTIONS OPERATE ON LOC. 0 TO VERIFY THE DATA RESULTS OF
                                        ;THE TEST.  THE PROPER DECREMENTING OF THE REGISTER IS ALSO
                                        ;VERIFIED IN THIS MANNER.
                                        ;       IF A FAILURE IS DETECTED BE SURE TO VERIFY THAT THE TABLE
                                        ;(LOC. 372 THRU 374) HAS THE PROPER VALUES (0).
                                        ;
                                        ;*******************************************************************
```

```
                                        ;TEST 64        TEST MODE 5 USING SOP INSTS
                                        ;*******************************************************************************
005326  005212                          TS64:   INC     (R2)            ;UPDATE TEST NUMBER
005330  022712  000064                          CMP     #64,(R2)        ;SEQUENCE ERROR?
005334  001025                                  BNE     TS65-10         ;BR TO ERROR HALT ON SEQ ERROR
005336  012700  000370                          MOV     #370,R0         ;CLEAR LOCATION 370-376
005342  005020                                  CLR     (R0)+           ;370
005344  005020                                  CLR     (R0)+           ;372
005346  005020                                  CLR     (R0)+           ;374
005350  005010                                  CLR     (R0)            ;376
005352  005000                                  CLR     R0              ;SET R0=376 (LOW BYTE)
005354  005020                                  CLR     (R0)+
005356  105400                                  NEGB    R0
005360  005050                                  CLR     @-(R0)          ;TRY TO CLEAR LOC 0 W/MODE 5
005362  001404                                  BEQ     SOP5A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 764            <
005364  012742  000126                          MOV     #126,-(R2)      ;MOVE TO MAILBOX #  *******  126  *******
005370  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005372  000000                                  HALT                    ;CLR DID NOT SET Z-BIT
005374  005200                          SOP5A:  INC     R0              ;RESET R0
005376  005200                                  INC     R0
005400  005150                                  COM     @-(R0)          ;TRY TO COMPLEMENT LOC. 0 W/MODE 5
005402  100002                                  BPL     SOP5B
005404  005250                                  INC     @-(R0)          ;TRY TO INCREMENT LOC. 0 W/MODE 5
005406  001404                                  BEQ     TS65
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 752            <
005410                                  SOP5B:
005410  012742  000127                          MOV     #127,-(R2)      ;MOVE TO MAILBOX #  *******  127  *******
005414  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005416  000000                                  HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INSTS
                                                                        ;  OR SEQUENCE ERROR


                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 6 SINGLE OPERAND INSTRUCTIONS.  IT
                                        ;USES LOCATION 0 AS ITS TARGET DATA.  R0 IS SET TO 400 USING
                                        ;PREVIOUSLY TESTED INSTRUCTIONS AND A MODE 6 CLR INSTRUCTION IS
                                        ;EXECUTED ON LOC. 0 USING R0 AND A -400 OFFSET.  COM AND INC
                                        ;INSTRUCTIONS ARE THEN USED TO VERIFY THE DATA.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 65        TEST MODE 6 USING SOP INSTS
                                        ;*******************************************************************************
005420  005212                          TS65:   INC     (R2)            ;UPDATE TEST NUMBER
005422  022712  000065                          CMP     #65,(R2)        ;SEQUENCE ERROR?
005426  001020                                  BNE     TS66-10         ;BR TO ERROR HALT ON SEQ ERROR
005430  005000                                  CLR     R0              ;SET R0=400
005432  105100                                  COMB    R0
005434  005200                                  INC     R0
005436  005060  177400                          CLR     -400(R0)        ;TRY TO CLEAR LOCATION 0 W/MODE 6
```

```
005442  001404                          BEQ     SOP6A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <===
                                                        ;           WHICH FOLLOWS W/ 771           <===
005444  012742  000130                  MOV     #130,-(R2)      ;MOVE TO MAILBOX #  *******  130  *******
005450  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005452  000000                          HALT                    ;CLR DID NOT SET Z-BIT
005454  005160  177400          SOP6A:  COM     -400(R0)        ;TRY TO COMPLEMENT LOCATION 0 W/MODE 6
005460  100003                          BPL     SOP6B
005462  005260  177400                  INC     -400(R0)        ;TRY TO INCREMENT LOCATION 0 W/MODE 6
005466  001404                          BEQ     TS66
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 757           <===
005470                          SOP6B:
005470  012742  000131                  MOV     #131,-(R2)      ;MOVE TO MAILBOX #  *******  131  *******
005474  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005476  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INSTS
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 7 SINGLE OPERAND INSTRUCTIONS.  IT USES
                                ;THE POINTER TO LOC. 0 WHICH IS STORED AT LOC. 402.
                                ;       R0 IS SET TO 400 AND A MODE 7 CLR INSTRUCTION IS
                                ;EXECUTED WITH A +2 OFFSET TO CLEAR LOC. 0.
                                ;       SEVERAL OTHER MODE 7 INSTRUCTIONS ARE THEN USED ON THE COMMON
                                ;LOCATION TO VERIFY THE DATA RESULTS.
                                ;
                                ;*******************************************************************************
                                ;TEST 66        TEST MODE 7 USING SOP INST.
                                ;*******************************************************************************
005500  005212                  TS66:   INC     (R2)            ;UPDATE TEST NUMBER
005502  022712  000066                  CMP     #66,(R2)        ;SEQUENCE ERROR?
005506  001021                          BNE     TS67-10         ;BR TO ERROR HALT ON SEQ ERROR
005510  005000                          CLR     R0              ;SET R0=400
005512  105100                          COMB    R0
005514  005200                          INC     R0
005516  005210                          INC     (R0)            ;R0=1
005520  005070  000002                  CLR     @2(R0)          ;TRY TO CLEAR LOC. 0 W/MODE 7
005524  001404                          BEQ     SOP7A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                        ;           CONDITIONAL BRANCH INST. AND   <===
                                                        ;           REPLACE THE MOVE INSTRUCTION   <===
                                                        ;           WHICH FOLLOWS W/ 770           <===
005526  012742  000132                  MOV     #132,-(R2)      ;MOVE TO MAILBOX #  *******  132  *******
005532  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005534  000000                          HALT                    ;CLR DID NOT SET Z-BIT
005536  005170  000002          SOP7A:  COM     @2(R0)          ;TRY TO COMPLEMENT LOC. 0 W/MODE 7
005542  100003                          BPL     SOP7B
005544  005270  000002                  INC     @2(R0)          ;TRY TO INCREMENT LOC. 0 W/MODE 7
005550  001404                          BEQ     TS67
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
```

```
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 756           <
005552                          SOP7B:
005552  012742  000133                  MOV     #133,-(R2)      ;MOVE TO MAILBOX #  *******  133  *******
005556  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005560  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INSTS.
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 67        TEST MODE 4 WITH NEGATE INSTRUCTION
                                ;*******************************************************************************
005562  005212                  TS67:   INC     (R2)            ;UPDATE TEST NUMBER
005564  022712  000067                  CMP     #67,(R2)        ;SEQUENCE ERROR?
005570  001024                          BNE     TS70-10         ;BR TO ERROR HALT ON SEQ ERROR
005572  005000                          CLR     R0
005574  005010                          CLR     (R0)
005576  005120                          COM     (R0)+           ;LOC. 0=177777,  R0 2
005600  005440                          NEG     -(R0)           ;TRY NEGATE, LOC. 0-1
005602  100403                          BMI     NEG40           ;(C=0001?
005604  001402                          BEQ     NEG40
005606  102401                          BVS     NEG40
005610  103404                          BCS     NEG41
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 767           <
005612                          NEG40:
005612  012742  000134                  MOV     #134,-(R2)      ;MOVE TO MAILBOX #  *******  134  *******
005616  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005620  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
005622  005400                  NEG41:  NEG     R0              ;TST R0 WITH A NEG.
005624  001404                          BEQ     NEG42
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 761           <
005626  012742  000135                  MOV     #135,-(R2)      ;MOVE TO MAILBOX #  *******  135  *******
005632  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005634  000000                          HALT                    ;R0 NOT DECREMENTED PROPERLY
005636  005310                  NEG42:  DEC     (R0)            ;TEST DTA RESULT OF NEG
005640  001404                          BEQ     TS70
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 753           <-
005642  012742  000136                  MOV     #136,-(R2)      ;MOVE TO MAILBOX #  *******  136  *******
005646  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005650  000000                          HALT                    ;DATA RESULT OF NEG INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 70        TEST MODE 5 WITH NEGATE INSTRUCTION
                                ;*******************************************************************************
005652  005212                  TS70:   INC     (R2)            ;UPDATE TEST NUMBER
005654  022712  000070                  CMP     #70,(R2)        ;SEQUENCE ERROR?
005660  001031                          BNE     TS71-10         ;BR TO ERROR HALT ON SEQ ERROR
005662  005000                          CLR     R0              ;R0=0
```

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005664  005010                          CLR     (R0)            ;LOC. 0-0
005666  105100                          COMB    R0              ;R0=377
005670  005200                          INC     R0              ;R0=400
005672  005010                          CLR     (R0)            ;SET 400 = 0
005674  005004                          CLR     R4              ;R4=0
005676  005314                          DEC     (R4)            ;LOC. 0=177777
005700  005450                          NEG     @-(R0)          ;TRY NEGATE:  LOC. 0=1
005702  100403                          BMI     NEG50           ;CC=0001?
005704  001402                          BEQ     NEG50
005706  102401                          BVS     NEG50
005710  103404                          BCS     NEG51
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 763           <====
005712                          NEG50:
005712  012742  000137                  MOV     #137,-(R2)      ;MOVE TO MAILBOX #  *******  137  *******
005716  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005720  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
005722  005314                  NEG51:  DEC     (R4)
005724  001404                          BEQ     NEG52
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;           CONDITIONAL BRANCH INST. AND   <---
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                ;           WHICH FOLLOWS W/ 755           <---
005726  012742  000140                  MOV     #140,-(R2)      ;MOVE TO MAILBOX #  *******  140  *******
005732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005734  000000                          HALT                    ;DATA RESULT OF NEG INCORRECT
005736  105100                  NEG52:  COMB    R0
005740  005300                          DEC     R0
005742  001404                          BEQ     TS71
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 746           <
005744  012742  000141                  MOV     #141,-(R2)      ;MOVE TO MAILBOX #  *******  141  *******
005750  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005752  000000                          HALT                    ;REGISTER NOT DECREMENTED PROPERLY
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 71        TEST MODE 6 WITH NEGATE
                                ;*******************************************************************
                                TS71:   INC     (R2)            ;UPDATE TEST NUMBER
005754  005212
005756  022712  000071                  CMP     #71,(R2)        ;SEQUENCE ERROR?
005762  001022                          BNE     TS72-10         ;BR TO ERROR HALT ON SEQ ERROR
005764  005000                          CLR     R0              ;R0=0
005766  005004                          CLR     R4              ;R4-0
005770  105100                          COMB    R0              ;R0=377
005772  005014                          CLR     (R4)            ;LOC. 0=0
005774  105024                          CLRB    (R4)+           ;LOC. 0=177777,  R4 '
005776  105114                          COMB    (R4)            ;LOC. 0=177400
006000  005460  177401                  NEG     -377(R0)        ;LOC. 0=400
006004  100403                          BMI     NEG60           ;CC=0001
006006  001402                          BEQ     NEG60
006010  102401                          BVS     NEG60
006012  103404                          BCS     NEG61
```

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                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 763           <====
006014                          NEG60:
006014  012742  000142                  MOV     #142,-(R2)      ;MOVE TO MAILBOX #  *******  142  *******
006020  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006022  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
006024  105314                  NEG61:  DECB    (R4)
006026  001404                          BEQ     TS72
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 755           <====
006030  012742  000143                  MOV     #143,-(R2)      ;MOVE TO MAILBOX #  *******  143  *******
006034  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006036  000000                          HALT                    ;DATA RESULT OF NEG INCORRECT
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 72        TEST MODE 7 W/ NEGATE
                                ;*******************************************************************
006040  005212                  TS72:   INC     (R2)            ;UPDATE TEST NUMBER
006042  022712  000072                  CMP     #72,(R2)        ;SEQUENCE ERROR?
006046  001024                          BNE     TS73-10         ;BR TO ERROR HALT ON SEQ ERROR
006050  005000                          CLR     R0              ;R0=0
006052  005010                          CLR     (R0)            ;LOC. 0=0
006054  005110                          COM     (R0)            ;LOC. 0=177777
006056  105100                          COMB    R0              ;R0=377
006060  105470  000005                  NEGB    @5(R0)          ;R0+5=404,  404-1,  LOC. 0-777
006064  100403                          BMI     NEG70           ;CC=0001?
006066  001402                          BEQ     NEG70
006070  102401                          BVS     NEG70
006072  103404                          BCS     NEG71
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 765           <
006074                          NEG70:
006074  012742  000144                  MOV     #144,-(R2)      ;MOVE TO MAILBOX #  *******  144  *******
006100  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006102  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
006104  105100                  NEG71:  COMB    R0              ;R0=0
006106  105120                          COMB    (R0)+           ;LOC. 0=400,  R0-1
006110  105310                          DECB    (R0)            ;LOC. 0=0
006112  005467  171662                  NEG     0               ;USE NEG MODE 67 TO TST FOR ZERO
006116  001404                          BEQ     TS73
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                        ;           CONDITIONAL BRANCH INST. AND   <=
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 753           <
006120  012742  000145                  MOV     #145,-(R2)      ;MOVE TO MAILBOX #  *******  145  *******
006124  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006126  000000                          HALT                    ;DATA RESULT OF NEG WAS INCORRECT
                                                                ;  OR SEQUENCE ERROR

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

```
                                        ;
                                        ;       THIS TEST VERIFIES PROGRAM COUNTER ADDRESSING WITH SOP
                                        ;INSTRUCTIONS.  CLR MODE 77 IS USED TO CLEAR THE LOCATION FOLLOWING THE
                                        ;INSTRUCTION (SOPX).  THEN SINGLE OPERAND INSTRUCTIONS WITH MODES 37, 67, AND
                                        ;77, USING INDIRECT POINTER SOPXAD ARE USED TO VERIFY THE DATA RESULTS
                                        ;OF THESE INSTRUCTIONS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 73        TEST SOP INSTRUCTIONS MODES 2,3,6,7 WITH REGISTER 7
                                        ;*******************************************************************************
006130  005212                          TS73:   INC     (R2)            ;UPDATE TEST NUMBER
006132  022712  000073                          CMP     #73,(R2)        ;SEQUENCE ERROR?
006136  001017                                  BNE     SOPB            ;BR TO ERROR HALT ON SEQ ERROR
006140  005027                                  CLR     (R7)+           ;CLEAR NEXT LOCATION: (SOPX)
006142  177777                          SOPX:   -1                      ;USE MODE 27
006144  001404                                  BEQ     SOPA
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 774            <
006146  012742  000146                          MOV     #146,-(R2)      ;MOVE TO MAILBOX #  *******  146  *******
006152  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006154  000000                                  HALT                    ;CLR DID NOT SET Z-BIT
006156  005237  006142                  SOPA:   INC     @#SOPX          ;INC SOPX W/MODE 37
006162  005467  177754                          NEG     SOPX            ;NEGATE SOPX W/MODE 67
006166  100003                                  BPL     SOPB
006170  005277  000012                          INC     @SOPXAD         ;INC SOPX W/MODE 77
006174  001405                                  BEQ     TS74
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 760            <
006176                                  SOPB:
006176  012742  000147                          MOV     #147,-(R2)      ;MOVE TO MAILBOX #  *******  147  *******
006202  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006204  000000                                  HALT                    ;INC DID NOT SET Z-BIT
                                                                        ;  OR SEQUENCE ERROR
006206  006142                          SOPXAD: SOPX                    ;INDIRECT ADDRESS OF SOPX

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES SINGLE OPERAND NON-MODIFYING INSTRUCTIONS
                                        ;USING MODE 0.  R0 IS SET TO ZERO AND THE CONDITION CODES ARE SET
                                        ;TO THE COMPLEMENT OF THAT EXPECTED BY THE INSTRUCTION.  A TST INSTRUCTION
                                        ;IS EXECUTED AND CONDITIONAL BRANCHES ARE USED TO TEST THE CONDITION
                                        ;CODES.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 74        TEST MODE 0 SOP NON-MODIFYING
                                        ;*******************************************************************************
006210  005212                          TS74:   INC     (R2)            ;UPDATE TEST NUMBER
006212  022712  000074                          CMP     #74,(R2)        ;SEQUENCE ERROR?
006216  001010                                  BNE     TS75-10         ;BR TO ERROR HALT ON SEQ ERROR
006220  005000                                  CLR     R0              ;INITIALIZE R0 0
006222  000277                                  SCC                     ;SET CC=1011
006224  000244                                  CLZ
```

```
006226  005700                          TST     R0              ;TRY TST W/ MODE 0
006230   02403                          BVS     SNM0A           ;CHECK THAT CC=0100
006232  100402                          BMI     SNM0A
006234  103401                          BCS     SNM0A
006236  001404                          BEQ     TS75
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-=-
                                                                ;           CONDITIONAL BRANCH INST. AND   <===-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=-==
                                                                ;           WHICH FOLLOWS W/ 767           <=--=
006240                          SNM0A:
006240  012742  000150                  MOV     #150,-(R2)      ;MOVE TO MAILBOX #  *******  150  *******
006244  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006246  000000                          HALT                    ;CONDITION CODES NOT SET PROPERLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES SINGLE OPERAND NON-MODIFYING BYTE INSTRUCTIONS WITH MODE 0.
                                ;R0 IS SET TO 377 AND COMPLEMENT OF THE EXPECTED CONDITION CODES
                                ;IS LOADED IN PSW.  A TSTB INSTRUCTION IS EXECUTED AND THE RESULTS
                                ;ARE CHECKED WITH SEVERAL CONDITIONAL BRANCH INSTRUCTIONS.
                                ;       THIS VERIFIES THAT THE PROPER BYTE WAS TESTED.
                                ;
                                ;*******************************************************************************
                                ;TEST 75        TEST  ODE 0 EVEN BYTE W/ SOP NON-MODIFYING
                                ;*******************************************************************************
006250  005212                  TS75:   INC     (R2)            ;UPDATE TEST NUMBER
006252  022712  000075                  CMP     #75,(R2)        ;SEQUENCE ERROR?
006256  001010                          BNE     TS76-10         ;BR TO ERROR HALT ON SEQ ERROR
006260  005000                          CLR     R0              ;INITIALIZE
006262  105100                          COMB    R0              ;R0=377
006264  000277                          SCC                     ;SET CC=0111
006266  000250                          CLN
006270  105700                          TSTB    R0              ;TRY TST EVEN BYTE
006272  102402                          BVS     SNMB0A          ;CHECK CC=1000
006274  101401                          BLOS    SNMB0A
006276  100404                          BMI     TS76
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 767           <
006300                          SNMB0A:
006300  012742  000151                  MOV     #151,-(R2)      ;MOVE TO MAILBOX #  *******  151  *******
006304  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006306  000000                          HALT                    ;CONDITION CODES NOT SET PROPERLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES SINGLE OPERAND INSTRUCTIONS WITH MODE 1.
                                ;R0 IS USED TO POINT TO AND CLEAR LOC. 0.  THE COMPLEMENT OF THE
                                ;EXPECTED CONDITION CODES ARE LOADED IN THE PSW.  A TST INSTRUCTION
                                ;IS THEN EXECUTED ON LOC. 0 USING R0 AND CONDITIONAL BRANCHES TEST
                                ;THE RESULTS.
                                ;
                                ;*******************************************************************************
```

```
                                        ;TEST 76        TEST MODE 1 SOP NON-MODIFYING
                                        ;*******************************************************************************
006310  005212                          TS76:   INC     (R2)            ;UPDATE TEST NUMBER
006312  022712  000076                          CMP     #76,(R2)        ;SEQUENCE ERROR?
006316  001011                                  BNE     TS77-10         ;BR TO ERROR HALT ON SEQ ERROR
006320  005000                                  CLR     R0              ;POINT TO LOC 0
006322  005010                                  CLR     (R0)            ;CLEAR LOC 0
006324  000277                                  SCC                     ;INITIALIZE
006326  000244                                  CLZ                     ;CC=1011
006330  005710                                  TST     (R0)            ;TRY TST W/ MODE 1
006332  102403                                  BVS     SNM1A           ;CHECK CC=0100
006334  103402                                  BCS     SNM1A
006336  100401                                  BMI     SNM1A
006340  001404                                  BEQ     TS77
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                        ;           WHICH FOLLOWS W/ 766           < -
006342                                  SNM1A:
006342  012742  000152                          MOV     #152,-(R2)      ;MOVE TO MAILBOX #  *******  152  *******
006346  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006350  000000                                  HALT                    ;CC'S NOT SET PROPERLY
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST SETS LOCATION 0 TO 377 AND THEN USES R0 TO TEST
                                        ;THE EVEN BYTE AND THE ODD BYTE USING SOP BYTE INSTRUCTIONS WITH MODE 1.
                                        ;AGAIN, CONDITIONAL BRANCHES ARE USED TO VERIFY THE SETTING OF THE
                                        ;PROPER CONDITION CODE BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 77        TEST MODE 1 BYTE INST. NON-MODIFYING
                                        ;*******************************************************************************
006352  005212                          TS77:   INC     (R2)            ;UPDATE TEST NUMBER
006354  022712  000077                          CMP     #77,(R2)        ;SEQUENCE ERROR?
006360  001026                                  BNE     TS100-10        ;BR TO ERROR HALT ON SEQ ERROR
006362  005000                                  CLR     R0              ;POINT TO LOC 0
006364  005010                                  CLR     (R0)            ;CLEAR LOC 0
006366  105110                                  COMB    (R0)            ;COMPLEMENT BYTE 0
006370  000277                                  SCC                     ;SET CC=0111
006372  000250                                  CLN
006374  105710                                  TSTB    (R0)            ;TRY TST ON EVEN BYTE
006376  102402                                  BVS     SNMB1A
006400  101401                                  BLOS    SNMB1A
006402  100404                                  BMI     SNMB1B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                        ;           CONDITIONAL BRANCH INST. AND   < -
                                                                        ;           REPLACE THE MOVE INSTRUCTION   < -
                                                                        ;           WHICH FOLLOWS W/ 766           <-
006404                                  SNMB1A:
006404  012742  000153                          MOV     #153,-(R2)      ;MOVE TO MAILBOX #  *******  153  *******
006410  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006412  000000                                  HALT                    ;CC'S NOT CORRECT
006414  005000                          SNMB1B: CLR     R0
006416  005200                                  INC     R0
```

```
006420  000277                          SCC                     ;SET CC=1011
006422  000244                          CLZ
006424  105710                          TSTB    (R0)            ;TRY TO TST AN ODD BYTE
006426  102403                          BVS     SNMB1C          ;CHECK CC=0100
006430  103402                          BCS     SNMB1C
006432  100401                          BMI     SNMB1C
006434  001404                          BEQ     TS100
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=--
                                                                ;           CONDITIONAL BRANCH INST. AND    <===
                                                                ;           REPLACE THE MOVE INSTRUCTION    <===-
                                                                ;           WHICH FOLLOWS W/ 751            <===-
006436                          SNMB1C:
006436  012742  000154                  MOV     #154,-(R2)      ;MOVE TO MAILBOX #  *******  154  *******
006442  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006444  000000                          HALT                    ;CC'S NOT CORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE SINGLE-OPERAND NON-MODIFYING INSTRUCTIONS
                                ;USING MODE 2.  IT USES THE IDENTICAL PROCEDURE EMPLOYED IN THE
                                ;MODE 1 TESTS.  ADDITIONALLY, THE REGISTER IS CHECKED TO ASSURE THAT
                                ;IT IS INCREMENTED PROPERLY.
                                ;
                                ;*******************************************************************************
                                ;TEST 100       TEST MODE 2 WITH SOP NON-MODIFYING
                                ;*******************************************************************************
006446  005212                  TS100:  INC     (R2)            ;UPDATE TEST NUMBER
006450  022712  000100                  CMP     #100,(R2)       ;SEQUENCE ERROR?
006454  001020                          BNE     TS101-10        ;BR TO ERROR HALT ON SEQ ERROR
006456  005000                          CLR     R0              ;INITIALIZE R0-0
006460  005010                          CLR     (R0)            ;CLEAR LOC 0
006462  000277                          SCC                     ;SET CC=1011
006464  000244                          CLZ
006466  005720                          TST     (R0)+           ;TRY TST W/ MODE 2
006470  102403                          BVS     SNM2A           ;CHECK CC=0100
006472  103402                          BCS     SNM2A
006474  100401                          BMI     SNM2A
006476  001404                          BEQ     SNM2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    < -
                                                                ;           WHICH FOLLOWS W/ 766            <
006500                          SNM2A:
006500  012742  000155                  MOV     #155,-(R2)      ;MOVE TO MAILBOX #  *******  155  *******
006504  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006506  000000                          HALT                    ;CC'S NOT CORRECT
006510  005300                  SNM2B:  DEC     R0              ;RESET R0
006512  005300                          DEC     R0
006514  001404                          BEQ     TS101
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <-  -
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 757            <
006516  012742  000156                  MOV     #156,-(R2)      ;MOVE TO MAILBOX #  *******  156  *******
006522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
006524  000000                          HALT                    ;MODE 2 DID NOT INC REG CORRECTLY
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 2 SINGLE OPERAND NON-MODIFYING BYTE
                                ;INSTRUCTIONS IT USES R0 TO POINT TO LOC. 0.  WITH LOCATION 0
                                ;SET TO 377, THE EVEN AND ODD BYTE IS TESTED WITH TSTB INSTRUCTIONS
                                ;TO VERIFY THE CORRECT CC ARE SET.  THE REGISTER IS CHECKED FOR
                                ;PROPER INCREMENTING.
                                ;
                                ;*******************************************************************
                                ;TEST 101       TEST MODE 2 - BYTE W/ SOP NON-MODIFYING
                                ;*******************************************************************
006526  005212                  TS101:  INC     (R2)            ;UPDATE TEST NUMBER
006530  022712  000101                  CMP     #101,(R2)       ;SEQUENCE ERROR?
006534  001042                          BNE     TS102-10        ;BR TO ERROR HALT ON SEQ ERROR
006536  005000                          CLR     R0              ;CLEAR R0
006540  005010                          CLR     (R0)            ;CLEAR LOC 0
006542  105110                          COMB    (R0)            ;SET LOC 0=377
006544  000277                          SCC                     ;SET CC=0111
006546  000250                          CLN
006550  105720                          TSTB    (R0)+           ;TRY TST OF EVEN BYTE
006552  102402                          BVS     SNMB2A
006554  101401                          BLOS    SNMB2A
006556  100404                          BMI     SNMB2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <-
006560                          SNMB2A:
006560  012742  000157                  MOV     #157,-(R2)      ;MOVE TO MAILBOX #  *******  157  *******
006564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006566  000000                          HALT                    ;CC'S NOT SET CORRECTLY
006570  005300                  SNMB2B: DEC     R0              ;DECREMENT R0
006572  001404                          BEQ     SNMB2C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 760           <-
006574  012742  000160                  MOV     #160,-(R2)      ;MOVE TO MAILBOX #  *******  160  *******
006600  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006602  000000                          HALT                    ;MODE 2 DID NOT INC REG CORRECTLY
006604  005200                  SNMB2C: INC     R0              ;POINT TO ODD BYTE
006606  000277                          SCC                     ;SET CC=1011
006610  000244                          CLZ
006612  105720                          TSTB    (R0)+           ;TRY TST OF ODD BYTE
006614  102403                          BVS     SNMB2D          ;CHECK CC'S-0100
006616  103402                          BCS     SNMB2D
006620  100401                          BMI     SNMB2D
006622  001404                          BEQ     SNMB2E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 744           <
006624                          SNMB2D:
```

```
006624  012742  000161                  MOV     #161,-(R2)      ;MOVE TO MAILBOX #  *******  161  *******
006630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006632  000000                          HALT                    ;CC'S NOT CORRECT
006634  005300                  SNMB2E: DEC     R0
006636  005300                          DEC     R0
006640  001404                          BEQ     TS102
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=
                                                                ;           WHICH FOLLOWS W/ 735           <=
006642  012742  000162                  MOV     #162,-(R2)      ;MOVE TO MAILBOX #  *******  162  *******
006646  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006650  000000                          HALT                    ;R0 DID NOT INCREMENT PROPERLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 3 SINGLE OPERAND NON-MODIFYING INSTRUCTIONS.
                                ;A POINTER IN A TABLE AT LOC. 376 IS USED TO TEST LOCATION 0.
                                ;THE CC'S AND THE REGISTER ARE CHECKED FOLLOWING THE
                                ;TST MODE 3 INSTRUCTION.
                                ;
                                ;*******************************************************************************
                                ;TEST 102       TEST MODE 3 W/ SOP NON-MODIFYING INSTS
                                ;*******************************************************************************
006652  005212                  TS102:  INC     (R2)            ;UPDATE TEST NUMBER
006654  022712  000102                  CMP     #102,(R2)       ;SEQUENCE ERROR?
006660  001022                          BNE     TS103-10        ;BR TO ERROR HALT ON SEQ ERROR
006662  005000                          CLR     R0              ;R0=0
006664  005010                          CLR     (R0)            ;CLEAR LOC 0
006666  105100                          COMB    R0              ;R0=376
006670  005300                          DEC     R0
006672  000277                          SCC                     ;SET CC=1011
006674  000244                          CLZ
006676  005730                          TST     @(R0)+          ;TRY TST W/ MODE 3
006700  102403                          BVS     SNM3A           ;CHECK CC=0100
006702  103402                          BCS     SNM3A
006704  100401                          BMI     SNM3A
006706  001404                          BEQ     SNM3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 764           <
006710                          SNM3A:
006710  012742  000163                  MOV     #163,-(R2)      ;MOVE TO MAILBOX #  *******  163  *******
006714  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006716  000000                          HALT                    ;CC'S NOT CORRECT
006720  005300                  SNM3B:  DEC     R0              ;R0=377
006722  105100                          COMB    R0              ;R0=0
006724  001404                          BEQ     TS103
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 755           <
006726  012742  000164                  MOV     #164,-(R2)      ;MOVE TO MAILBOX #  *******  164  *******
006732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
006734  000000                          HALT                    ;MODE 3 DID NOT INC REG CORRECTLY
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES SOP NON-MODIFYING BYTE INSTRUCTIONS MODE 3
                                ;LOC. 0 IS SET TO 377.  TABLE AT LOC. 402-404 IS USED TO TEST
                                ;BYTE 0 AND BYTE 1.  THE REGISTER IS CHECKED FOR PROPER INCREMENTING AND
                                ;THE CC'S ARE VERIFIED.
                                ;       THE TABLE AT LOC. 402-404 SHOULD CONTAIN 0 AND 1 BEFORE AND
                                ;AFTER THE TEST IS RUN.
                                ;
                                ;*******************************************************************
                                ;TEST 103       TEST MODE 3 - BYTES W/ SOP NON-MODIFYING INSTS.
                                ;*******************************************************************
006736  005212                  TS103:  INC     (R2)            ;UPDATE TEST NUMBER
006740  022712  000103                  CMP     #103,(R2)       ;SEQUENCE ERROR?
006744  001036                          BNE     TS104-10        ;BR TO ERROR HALT ON SEQ ERROR
006746  005000                          CLR     R0              ;R0=0
006750  005010                          CLR     (R0)            ;CLEAR LOC 0
006752  105110                          COMB    (R0)            ;LOC. 0 =377
006754  105100                          COMB    R0
006756  005200                          INC     R0
006760  005720                          TST     (R0)+           ;R0=402
006762  000277                          SCC                     ;CC=0111
006764  000250                          CLN
006766  105730                          TSTB    @(R0)+          ;TRY TST OF EVEN BYTE
006770  102402                          BVS     SNMB3A          ;CHECK CC=1000
006772  101401                          BLOS    SNMB3A
006774  100404                          BMI     SNMB3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 763           <
006776                          SNMB3A:
006776  012742  000165                  MOV     #165,-(R2)      ;MOVE TO MAILBOX #  *******  165  *******
007002  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007004  000000                          HALT                    ;CC'S NOT CORRECT
007006  000277                  SNMB3B: SCC                     ;SET CC=1011
007010  000244                          CLZ
007012  105730                          TSTB    @(R0)+          ;TRY TST OF ODD BYTE
007014  102403                          BVS     SNMB3C          ;CHECK CC=0100
007016  103402                          BCS     SNMB3C
007020  100401                          BMI     SNMB3C
007022  001404                          BEQ     SNMB3D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 750           <
007024                          SNMB3C:
007024  012742  000166                  MOV     #166,-(R2)      ;MOVE TO MAILBOX #  *******  166  *******
007030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007032  000000                          HALT                    ;CC'S NOT CORRECT
007034  005720                  SNMB3D: TST     (R0)+           ;R0=410
007036  005710                          TST     (R0)
007040  100404                          BMI     TS104
```

```
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 741           <====
007042  012742  000167          MOV     #167,-(R2)      ;MOVE TO MAILBOX #  *******  167  *******
007046  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007050  000000                  HALT                    ;TSTB DID NOT INCREMENT R0 CORRETCLY
                                                        ;  OR SEQUENCE ERROR

                        ;*******************************************************************************
                        ;
                        ;       THIS TEST VERIFIES MODE 4 SOP NON-MODIFYING INSTRUCTIONS.
                        ;LOC. 0 IS SET TO -1 AND THE CC'S ARE SET TO THE COMPLEMENT OF THE
                        ;EXPECTED RESULTS.  R0 AND SET TO 2 AND A TST MODE 4 IS EXECUTED.
                        ;THE CC'S ARE CHECKED WITH CONDITIONAL BRANCH INSTRUCTIONS AND THE REGISTER
                        ;IS CHECKED FOR PROPER DECREMENTING.
                        ;
                        ;*******************************************************************************
                        ;TEST 104       TEST MODE 4 W/ SOP NON-MODIFYING INSTS
                        ;*******************************************************************************
007052  005212          TS104:  INC     (R2)            ;UPDATE TEST NUMBER
007054  022712  000104          CMP     #104,(R2)       ;SEQUENCE ERROR?
007060  001017                  BNE     TS105-10        ;BR TO ERROR HALT ON SEQ ERROR
007062  005000                  CLR     R0              ;R0=0
007064  005010                  CLR     (R0)            ;LOC 0=0
007066  005120                  COM     (R0)+           ;LOC 0=-1
007070  000277                  SCC                     ;SET CC=1011
007072  000244                  CLZ
007074  005740                  TST     -(R0)           ;TRY TST W/ MODE 4
007076  102402                  BVS     SNM4A           ;CHECK CC=0100
007100  101401                  BLOS    SNM4A
007102  100404                  BMI     SNM4B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 766           <
007104                  SNM4A:
007104  012742  000170          MOV     #170,-(R2)      ;MOVE TO MAILBOX #  *******  170  *******
007110  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007112  000000                  HALT                    ;CC'S NOT CORRECT
007114  005700          SNM4B:  TST     R0
007116  001404                  BEQ     TS105
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 760           <
007120  012742  000171          MOV     #171,-(R2)      ;MOVE TO MAILBOX #  *******  171  *******
007124  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007126  000000                  HALT                    ;TST MODE 4 DID NOT DEC R0 CORRECTLY
                                                        ;  OR SEQUENCE ERROR

                        ;*******************************************************************************
                        ;
                        ;       THIS TEST VERIFIES MODE 5 SOP NON-MODIFYING INSTRUCTIONS.
                        ;IT USES A POINTER AT LOC. 376 TO TEST LOC. 0.  R0 IS SET
                        ;TO 400, A TST MODE 5 INSTRUCTION IS EXECUTED AND THE CC'S CHECKED.
                        ;R0 IS CHECKED TO INSURE PROPER DECREMENTING.
```

```
                                        ;
                                        ;*******************************************************************
                                        ;TEST 105       TEST MODE 5 W/ SOP NON-MODIFYING INSTS
                                        ;*******************************************************************
007130  005212                          TS105:  INC     (R2)            ;UPDATE TEST NUMBER
007132  022712  000105                          CMP     #105,(R2)       ;SEQUENCE ERROR?
007136  001022                                  BNE     TS106-10        ;BR TO ERROR HALT ON SEQ ERROR
007140  005000                                  CLR     R0              ;R0=0
007142  005010                                  CLR     (R0)            ;LOC 0=0
007144  005110                                  COM     (R0)            ;LOC 0=-1
007146  105100                                  COMB    R0              ;R0=377
007150  005200                                  INC     R0              ;R0=400
007152  000277                                  SCC                     ;SET CC=0111
007154  000250                                  CLN
007156  005750                                  TST     @-(R0)          ;TRY TST W/ MODE 5
007160  102402                                  BVS     SNM5A           ;CHECK CC=1000
007162  101401                                  BLOS    SNM5A
007164  100404                                  BMI     SNM5B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 764           <
007166                                  SNM5A:
007166  012742  000172                          MOV     #172,-(R2)      ;MOVE TO MAILBOX #  *******  172  *******
007172  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007174  000000                                  HALT                    ;CC'S NOT SET PROPERLY
007176  005200                          SNM5B:  INC     R0              ;R0=377
007200  105100                                  COMB    R0              ;R0=0
007202  001404                                  BEQ     TS106
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 755           <
007204  012742  000173                          MOV     #173,-(R2)      ;MOVE TO MAILBOX #  *******  173  *******
007210  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007212  000000                                  HALT                    ;MODE 5 DID NOT DEC R0 CORRECTLY
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 6 SOP NON-MODIFYING INSTRUCTIONS.
                                        ;R0 IS SET TO 377 AND A MODE 6 TST INSTRUCTION IS EXECUTED
                                        ;USING R0 AND AN OFFSET OF -377.  THE CC'S ARE CHECKED AS WELL
                                        ;AS R0 TO INSURE IT WAS NOT ALTERED.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 106       TEST MODE 6 W/ SOP NON-MODIFYING INSTS
                                        ;*******************************************************************
007214  005212                          TS106:  INC     (R2)            ;UPDATE TEST NUMBER
007216  022712  000106                          CMP     #106,(R2)       ;SEQUENCE ERROR?
007222  001021                                  BNE     TS107-10        ;BR TO ERROR HALT ON SEQ ERROR
007224  005000                                  CLR     R0              ;R0=0
007226  005010                                  CLR     (R0)            ;LOC 0=0
007230  005110                                  COM     (R0)            ;LOC 0=-1
007232  105100                                  COMB    R0              ;R0-377
007234  000277                                  SCC                     ;SET CC=0111
```

```
007236  000250                          CLN
007240  005760  177401                  TST     -377(R0)        ;TRY TST W/ MODE 6
007244  102402                          BVS     SNM6A           ;CHECK CC=1000
007246  101401                          BLOS    SNM6A
007250  100404                          BMI     SNM6B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 764            <====
007252                          SNM6A:
007252  012742  000174                  MOV     #174,-(R2)      ;MOVE TO MAILBOX #  *******  174  *******
007256  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007260  000000                          HALT                    ;CC'S INCORRECT
007262  105100                  SNM6B:  COMB    R0              ;R0-0
007264  001404                          BEQ     TS107
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 756            <====
007266  012742  000175                  MOV     #175,-(R2)      ;MOVE TO MAILBOX #  *******  175  *******
007272  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007274  000000                          HALT                    ;TST MODE 6 INCORRECTLY CHANGED R0
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 7 SOP NON-MODIFYING INSTRUCTIONS.
                                        ;IT USES A POINTER TO LOC. 0 STORED AT LOC. 400 TO TST LOC. 0.
                                        ;R0 IS SET TO 377 AND LOC. 0 IS TESTED THRU THE POINTER AT 400 USING
                                        ;R0 AND AN OFFSET OF 1.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 107       TEST MODE 7 W/ SOP NON-MODIFYING INSTS.
                                        ;*******************************************************************
007276  005212                          TS107:  INC     (R2)            ;UPDATE TEST NUMBER
007300  022712  000107                          CMP     #107,(R2)       ;SEQUENCE ERROR?
007304  001021                                  BNE     TS110-10        ;BR TO ERROR HALT ON SEQ ERROR
007306  005000                                  CLR     R0              ;R0=0
007310  005010                                  CLR     (R0)            ;LOC 0=0
007312  005110                                  COM     (R0)            ;LOC 0=-1
007314  105100                                  COMB    R0              ;R0=377
007316  000277                                  SCC                     ;CC=0111
007320  000250                                  CLN
007322  005770  000001                          TST     @1(R0)          ;TRY TST W/ MODE 7
007326  102402                                  BVS     SNM7A           ;CHECK CC=1000
007330  101401                                  BLOS    SNM7A
007332  100404                                  BMI     SNM7B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 764           <
007334                                  SNM7A:
007334  012742  000176                          MOV     #176,-(R2)      ;MOVE TO MAILBOX #  *******  176  *******
007340  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007342  000000                                  HALT                    ;CC'S NOT CORRECT
007344  105100                          SNM7B:  COMB    R0              ;R0=0
007346  001404                                  BEQ     TS110
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 756           <
007350  012742  000177                          MOV     #177,-(R2)      ;MOVE TO MAILBOX #  *******  177  *******
007354  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007356  000000                                  HALT                    ;TST MODE 7 INCORRECTLY CHANGED R0
                                                                        ;  OR SEQUENCE ERROR
```

```
                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 0 DOUBLE OPERAND INSTRUCTIONS.  IT SETS
                                ;DATA IN R0 AND R4 AND USES THE ADD INSTRUCTION TO TEST THE DOP
                                ;MICROCODE.
                                ;
                                ;*******************************************************************
                                ;TEST 110       TEST MODE 0 DOUBLE-OPERAND (DOP) INSTS.
                                ;*******************************************************************
007360  005212                  TS110:  INC     (R2)            ;UPDATE TEST NUMBER
007362  022712  000110                  CMP     #110,(R2)       ;SEQUENCE ERROR?
007366  001006                          BNE     TS111-10        ;BR TO ERROR HALT ON SEQ ERROR
007370  005000                          CLR     R0              ;R0=0
007372  005100                          COM     R0              ;R0=-1
007374  005004                          CLR     R4              ;R4=0
007376  060004                          ADD     R0,R4           ;TRY ADD: R4--1
007400  005204                          INC     R4              ;R4=0
007402  001404                          BEQ     TS111
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 771           <====
007404  012742  000200                  MOV     #200,-(R2)      ;MOVE TO MAILBOX #  *******  200  *******
007410  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007412  000000                          HALT                    ;ADD INST. FAILED W/ MODE 0
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE MOVE INSTRUCTION WITH MODE 0 TO MODE 0.
                                ;
                                ;*******************************************************************
                                ;TEST 111       MOV MODE 0 TO MODE 0
                                ;*******************************************************************
007414  005212                  TS111:  INC     (R2)            ;UPDATE TEST NUMBER
007416  022712  000111                  CMP     #111,(R2)       ;SEQUENCE ERROR?
007422  001006                          BNE     TS112-10        ;BR TO ERROR HALT ON SEQ ERROR
007424  005000                          CLR     R0              ;R0=0
007426  005004                          CLR     R4              ;R4=0
007430  005100                          COM     R0              ;R0=-1
007432  010004                          MOV     R0,R4           ;TRY MOVE -1 TO R4
007434  005204                          INC     R4              ;INC R4
007436  001404                          BEQ     TS112
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 771           <
007440  012742  000201                  MOV     #201,-(R2)      ;MOVE TO MAILBOX #  *******  201  *******
007444  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007446  000000                          HALT                    ;MOVE FAILED MODE 0 TO MODE 0
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE SUBTRACT INSTRUCTION WITH MODE 0.0.
```

```
                                ;
                                ;*******************************************************************
                                ;TEST 112        TEST SUB MODE 0,0
                                ;*******************************************************************
007450  005212                  TS112:  INC     (R2)            ;UPDATE TEST NUMBER
007452  022712  000112                  CMP     #112,(R2)       ;SEQUENCE ERROR?
007456  001016                          BNE     TS113-10        ;BR TO ERROR HALT ON SEQ ERROR
007460  005000                          CLR     R0              ;R0=0
007462  005004                          CLR     R4              ;R4=0
007464  005204                          INC     R4              ;R4=1
007466  160400                          SUB     R4,R0           ;TRY SUB 0,0   R0--1
007470  100003                          BPL     SUB0            ;CC=1001
007472  001402                          BEQ     SUB0
007474  102401                          BVS     SUB0
007476  103404                          BCS     SUB0A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 767           <====
007500                          SUB0:
007500  012742  000202                  MOV     #202,-(R2)      ;MOVE TO MAILBOX #  *******  202  *******
007504  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007506  000000                          HALT                    ;CONDITION CODE FAILED ON SUB
007510  005200                  SUB0A:  INC     R0
007512  001404                          BEQ     TS113
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
007514  012742  000203                  MOV     #203,-(R2)      ;MOVE TO MAILBOX #  *******  203  *******
007520  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007522  000000                          HALT                    ;DATA RESULT OF SUB FAILED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST QUICKLY VERIFIES THE REMAINING DOP MODIFYING INSTRUCTIONS
                                        ;WITH MODE 0,0 TO PROVIDE A BASELINE FOR SUBSEQUENT TESTS.
                                        ;SINGLE OPERAND INSTRUCTIONS ARE USED TO SET UP DATA IN R0 AND R4
                                        ;BEFORE EACH OF THE SEVERAL DOP MODIFYING INSTRUCTIONS ARE USED AND
                                        ;VERIFIED.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 113       TEST ALL THE DOP INSTRUCTIONS W/ SOURCE MODE 0,0
                                        ;*******************************************************************************
007524  005212                          TS113:  INC     (R2)            ;UPDATE TEST NUMBER
007526  022712  000113                          CMP     #113,(R2)       ;SEQUENCE ERROR?
007532  001051                                  BNE     TS114-10        ;BR TO ERROR HALT ON SEQ ERROR
007534  005000                                  CLR     R0              ;R0=0
007536  010004                                  MOV     R0,R4           ;TRY MOVE MODE 0,0
007540  001404                                  BEQ     DOP0A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-==
                                                                        ;           CONDITIONAL BRANCH INST. AND    <===-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <===-
                                                                        ;           WHICH FOLLOWS W/ 774            <-
007542  012742  000204                          MOV     #204,-(R2)      ;MOVE TO MAILBOX #  *******  204  *******
007546  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007550  000000                                  HALT                    ;Z-BIT NOT SET
007552  005200                          DOP0A:  INC     R0              ;R0=1
007554  005100                                  COM     R0              ;R0=177776
007556  005104                                  COM     R4              ;R4=177777
007560  040004                                  BIC     R0,R4           ;TRY BIC: R4-1
007562  005304                                  DEC     R4              ;R4=0
007564  001404                                  BEQ     DOP0B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <---
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 762            <=
007566  012742  000205                          MOV     #205,-(R2)      ;MOVE TO MAILBOX #  *******  205  *******
007572  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007574  000000                                  HALT                    ;BIC CLEAR RESULT INCORRECT
007576  050004                          DOP0B:  BIS     R0,R4           ;TRY BIS: R4=177777
007600  005204                                  INC     R4
007602  005204                                  INC     R4              ;R4=0
007604  001404                                  BEQ     DOP0C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-- -
                                                                        ;           CONDITIONAL BRANCH INST. AND    <=-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <  --
                                                                        ;           WHICH FOLLOWS W/ 752            <
007606  012742  000206                          MOV     #206,-(R2)      ;MOVE TO MAILBOX #  *******  206  *******
007612  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007614  000000                                  HALT                    ;RESULT OF BIS INCORRECT
007616  005000                          DOP0C:  CLR     R0              ;R0=0
007620  105100                                  COMB    R0              ;R0=377
007622  005004                                  CLR     R4              ;R4=0
007624  005104                                  COM     R4              ;R4=177777
007626  040004                                  BIC     R0,R4           ;R4=177400
007630  060004                                  ADD     R0,R4           ;TRY ADD: R4=177777
007632  005204                                  INC     R4              ;R4=0
```

```
007634  001404                          BEQ     DOPOD
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <=
                                                        ;           REPLACE THE MOVE INSTRUCTION   <==-
                                                        ;           WHICH FOLLOWS W/ 736
007636  012742  000207                  MOV     #207,-(R2)  ;MOVE TO MAILBOX #  *******  207  *******
007642  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
007644  000000                          HALT                ;RESULT OF ADD INCORRECT
007646  160004                  DOPOD:  SUB     R0,R4       ;177401=R4
007650  105404                          NEGB    R4          ;R4=177777
007652  005204                          INC     R4          ;RD=0
007654  001404                          BEQ     TS114
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <==--
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 726           <===-
007656  012742  000210                  MOV     #210,-(R2)  ;MOVE TO MAILBOX #  *******  210  *******
007662  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
007664  000000                          HALT                ;RESULT OF SUB INCORRECT
                                                            ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 0,X DOUBLE OPERAND INSTRUCTIONS.  IT SETS
                                        ;DATA IN R0 AND LOCATION 0 AND OPERATES UPON IT USING DOP INSTRUCTIONS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 114       TEST MODE 0,X DOUBLE-OPERAND INSTRUCTIONS
                                        ;*******************************************************************************
007666  005212                          TS114:  INC     (R2)            ;UPDATE TEST NUMBER
007670  022712  000114                          CMP     #114,(R2)       ;SEQUENCE ERROR?
007674  001024                                  BNE     TS115-10        ;BR TO ERROR HALT ON SEQ ERROR
007676  005000                                  CLR     R0              ;R0=0
007700  005010                                  CLR     (R0)            ;LOC. 0=0
007702  105110                                  COMB    (R0)            ;LOC. 0=377
007704  005220                                  INC     (R0)+           ;LOC. 0=400   R0=2
007706  005400                                  NEG     R0              ;R0=-2
007710  060037  000000                          ADD     R0,@#0          ;TRY ADD 0,3;  LOC. 0=376
007714  100403                                  BMI     DOP03A          ;CC=0001?
007716  001402                                  BEQ     DOP03A
007720  102401                                  BVS     DOP03A
007722  103404                                  BCS     DOP03B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 764           <====
007724                                  DOP03A:
007724  012742  000211                          MOV     #211,-(R2)      ;MOVE TO MAILBOX #  *******  211  *******
007730  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007732  000000                                  HALT                    ;CC'S NOT SET CORRECTLY
007734  105137  000000                  DOP03B: COMB    @#0             ;LOC. 0=1
007740  005337  000000                          DEC     @#0             ;LOC. 0=0
007744  001404                                  BEQ     TS115
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <==
                                                                        ;           CONDITIONAL BRANCH INST. AND   <===
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <==
                                                                        ;           WHICH FOLLOWS W/ 753           <==
007746  012742  000212                          MOV     #212,-(R2)      ;MOVE TO MAILBOX #  *******  212  *******
007752  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007754  000000                                  HALT                    ;DATA RESULT INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 0,0 DOP NON-MODIFYING INSTRUCTIONS.
                                        ;R0 AND R4 ARE PRESET TO 0 AND 1 RESPECTIVELY.  COMPARE INSTRUCTIONS ARE
                                        ;THEN EXECUTED AND CHECKED.  FIRST R4 IS COMPARED TO R0 THEN R0 TO R4.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 115       TEST DOP NON-MODIFYING INST. W/ SOURCE MODE 0,0
                                        ;*******************************************************************************
007756  005212                          TS115:  INC     (R2)            ;UPDATE TEST NUMBER
007760  022712  000115                          CMP     #115,(R2)       ;SEQUENCE ERROR?
007764  001042                                  BNE     TS116-10        ;BR TO ERROR HALT ON SEQ ERROR
007766  005000                                  CLR     R0              ;R0=0
007770  005004                                  CLR     R4              ;R4=0
007772  005204                                  INC     R4              ;R4=1
007774  020400                                  CMP     R4,R0           ;TRY COMPARE R4 TO R0
007776  003004                                  BGT     DNM1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   < --
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 772           <
010000  012742  000213                          MOV     #213,-(R2)      ;MOVE TO MAILBOX #  *******  213  *******
010004  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010006  000000                                  HALT                    ;CC'S NOT CORRECT FOR CMP
010010  020004                          DNM1:   CMP     R0,R4           ;TRY COMPARE R0 TO R4
010012  002404                                  BLT     DNM2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <  -
                                                                        ;           WHICH FOLLOWS W/ 764           <
010014  012742  000214                          MOV     #214,-(R2)      ;MOVE TO MAILBOX #  *******  214  *******
010020  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010022  000000                                  HALT                    ;CC'S NOT CORRECT FOR CMP
010024  005200                          DNM2:   INC     R0              ;R0=1
010026  020400                                  CMP     R4,R0           ;TRY COMPARE R4=1 TO R0=1
010030  001404                                  BEQ     DNM3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 755           <
010032  012742  000215                          MOV     #215,-(R2)      ;MOVE TO MAILBOX #  *******  215  *******
010036  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010040  000000                                  HALT                    ;CC'S NOT CORRECT (Z=1) FOR CMP
010042  005000                          DNM3:   CLR     R0              ;R0=0
010044  005100                                  COM     R0              ;R0=177777
010046  005004                                  CLR     R4              ;R4=0
010050  030004                                  BIT     R0,R4           ;TRY BIT R0 TO R4
010052  001404                                  BEQ     DNM4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-- -
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                        ;           WHICH FOLLOWS W/ 744           <- -
010054  012742  000216                          MOV     #216,-(R2)      ;MOVE TO MAILBOX #  *******  216  *******
010060  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010062  000000                                  HALT                    ;CC'S NOT CORRECT FOR BIT
010064  005304                          DNM4:   DEC     R4              ;R4=177777
```

```
010066  030004                          BIT     R0,R4           ;TRY BIT AGAIN
010070  100404                          BMI     TS116
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=---
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <- -
                                                                ;           WHICH FOLLOWS W/ 735           <-=--
010072  012742  000217                  MOV     #217,-(R2)      ;MOVE TO MAILBOX #  *******  217  *******
010076  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010100  000000                          HALT                    ;CC'S NOT CORRECT FOR BIT
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 0,X DOUBLE OPERAND NON-MODIFYING INSTRUCTIONS.
                                ;IT SETS DATA IN R0 AND LOCATION 0 AND COMPARES THEM USING DOPNM INSTRUCTIONS.
                                ;
                                ;*******************************************************************************
                                ;TEST 116       TEST MODE 0,X DOUBLE-OPERAND NON-MODIFYING INSTS.
                                ;*******************************************************************************
010102  005212                  TS116:  INC     (R2)            ;UPDATE TEST NUMBER
010104  022712  000116                  CMP     #116,(R2)       ;SEQUENCE ERROR?
010110  001022                          BNE     TS117-10        ;BR TO ERROR HALT ON SEQ ERROR
010112  005000                          CLR     R0              ;R0=0
010114  005010                          CLR     (R0)            ;LOC. 0-0
010116  005110                          COM     (R0)            ;LOC. 0=177777
010120  005200                          INC     R0              ;R0=1
010122  020037  000000                  CMP     R0,@#0          ;TRY CMP MODE 0,3
010126  100403                          BMI     DNM03A          ;CC=0001
010130  001402                          BEQ     DNM03A
010132  102401                          BVS     DNM03A
010134  103404                          BCS     DNM03B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 765           <
010136                          DNM03A:
010136  012742  000220                  MOV     #220,-(R2)      ;MOVE TO MAILBOX #  *******  220  *******
010142  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010144  000000                          HALT                    ;CC'S NOT SET CORRECTLY
010146  005300                  DNM03B: DEC     R0
010150  001002                          BNE     DNM03C
010152  005210                          INC     (R0)
010154  001404                          BEQ     TS117
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 755           <
010156                          DNM03C:
010156  012742  000221                  MOV     #221,-(R2)      ;MOVE TO MAILBOX #  *******  221  *******
010162  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010164  000000                          HALT                    ;DATA INCORRECTLY MODIFIED BY CMP
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 1 DOP INSTRUCTIONS.  R0 IS SET TO -1
                                        ;AND LOC 0 TO 1.  R4 IS THEN CLEARED AND USED TO POINT TO LOC 0.
                                        ;IN THE ADD MODE 1 INSTRUCTION, LOC 0 IS ADDED TO R0 AND THE
                                        ;RESULTS VERIFIED.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 117       TEST MODE 1 W/ DOP INST.
                                        ;*******************************************************************************
010166  005212                          TS117:  INC     (R2)            ;UPDATE TEST NUMBER
010170  022712  000117                          CMP     #117,(R2)       ;SEQUENCE ERROR?
010174  001007                                  BNE     TS120-10        ;BR TO ERROR HALT ON SEQ ERROR
010176  005000                                  CLR     R0              ;R0=0
010200  005100                                  COM     R0              ;R0=177777
010202  005004                                  CLR     R4              ;R4=0
010204  005014                                  CLR     (R4)            ;LOC 0=0
010206  005214                                  INC     (R4)            ;LOC 0=1
010210  061400                                  ADD     (R4),R0         ;TRY ADD SOURCE MODE 1
010212  001404                                  BEQ     TS120
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <===-
                                                                        ;           WHICH FOLLOWS W/ 770           < =-=
010214  012742  000222                          MOV     #222,-(R2)      ;MOVE TO MAILBOX #  *******  222  *******
010220  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010222  000000                                  HALT                    ;RESULT OF ADD INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 1 DOP BYTE INSTRUCTIONS WHICH ADDRESS
                                        ;EVEN BYTES.  LOC. 0 IS SET TO -1 AND R4 IS CLEARED.  THEN R4 IS
                                        ;SET TO -1 USING A BISB THRU R0 WITH MODE 1.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 120       TEST MODE 1 - EVEN BYTE W/ DOP INSTS.
                                        ;*******************************************************************************
010224  005212                          TS120:  INC     (R2)            ;UPDATE TEST NUMBER
010226  022712  000120                          CMP     #120,(R2)       ;SEQUENCE ERROR?
010232  001007                                  BNE     TS121-10        ;BR TO ERROR HALT ON SEQ ERROR
010234  005000                                  CLR     R0              ;R0=0
010236  005010                                  CLR     (R0)            ;LOC. 0=0
010240  005110                                  COM     (R0)            ;LOC. 0=177777
010242  005004                                  CLR     R4              ;R4=0
010244  151004                                  BISB    (R0),R4         ;TRY MODE 1- EVEN BYTE W/ DOP
010246  105104                                  COMB    R4              ;R4=0
010250  001404                                  BEQ     TS121
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <= =-
                                                                        ;           WHICH FOLLOWS W/ 770           <-=-=
010252  012742  000223                          MOV     #223,-(R2)      ;MOVE TO MAILBOX #  *******  223  *******
010256  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010260  000000                                  HALT                    ;RESULT OF BISB IS INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 1 DOP NON-MODIFYING INSTRUCTIONS
                                        ;WHICH ADDRESS EVEN BYTES.  LOC. 0 IS SET TO -1 AND R0 IS CLEARED
                                        ;AND USED AS THE ADDRESSING REGISTER.  R4 IS SET TO 377 AND A
                                        ;MODE 1,0 CMPB INSTRUCTION IS USED THE RESULTS VERIFIED.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 121       TEST MODE 1 - EVEN BYTE W/ DOP NON-MODIFYING INST.
                                        ;*******************************************************************************
010262  005212                          TS121:  INC     (R2)            ;UPDATE TEST NUMBER
010264  022712  000121                          CMP     #121,(R2)       ;SEQUENCE ERROR?
010270  001007                                  BNE     TS122-10        ;BR TO ERROR HALT ON SEQ ERROR
010272  005000                                  CLR     R0              ;R0=0
010274  005010                                  CLR     (R0)            ;LOC 0=0
010276  005110                                  COM     (R0)            ;LOC 0=177777
010300  005004                                  CLR     R4              ;R4=0
010302  105104                                  COMB    R4              ;R4=377
010304  121004                                  CMPB    (R0),R4         ;TRY MODE 1 - EVEN BYTE W/ DOP NON-MODIFYING
010306  001404                                  BEQ     TS122
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    < -
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 770            <
010310  012742  000224                          MOV     #224,-(R2)      ;MOVE TO MAILBOX #  *******  224  *******
010314  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010316  000000                                  HALT                    ;RESULT OF CMPB INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 1,0 MOVB INSTRUCTIONS
                                        ;WHICH ADDRESS EVEN BYTES.  LOC. 0 IS SET TO 177400, R0 IS CLEARED AND
                                        ;R4 IS SET TO -1.  MOVB ARE USED TO MOVE BYTE 0 TO R4.  THIS
                                        ;VERIFIES THAT THE PROPER BYTE WAS SELECTED AND THAT THE SIGN-X-TEND
                                        ;FUNCTION WITH MODE 0.
                                        ;       THEN LOC. 0 IS COMPLEMENTED AND THE SAME PROCEDURE EXERCISES
                                        ;THE LOGIC FOR COMPLEMENTARY DATA.
                                        ;       THIS TEST EXERCISES UNIQUE MICROCODE.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 122       TEST MOV INSTRUCTION MODE 1,0 EVEN BYTE
                                        ;*******************************************************************************
010320  005212                          TS122:  INC     (R2)            ;UPDATE TEST NUMBER
010322  022712  000122                          CMP     #122,(R2)       ;SEQUENCE ERROR?
010326  001020                                  BNE     TS123-10        ;BR TO ERROR HALT ON SEQ ERROR
010330  005000                                  CLR     R0              ;R0=0
010332  005010                                  CLR     (R0)            ;LOC 0=0
010334  105110                                  COMB    (R0)            ;LOC 0=177400
010336  005110                                  COM     (R0)
010340  005004                                  CLR     R4              ;R4=0
010342  005104                                  COM     R4              ;R4-177777
010344  111004                                  MOVB    (R0),R4         ;R4=0
010346  005704                                  TST     R4              ;CHECK SIGN OF WORD
010350  001404                                  BEQ     DOP1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-===
                                                                        ;           WHICH FOLLOWS W/ 766           <---
010352  012742  000225                          MOV     #225,-(R2)      ;MOVE TO MAILBOX #  *******  225  *******
010356  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010360  000000                                  HALT                    ;MOVB SHOULD SIGN X-TEND
010362  005110                          DOP1:   COM     (R0)            ;LOC 0=177777
010364  111004                                  MOVB    (R0),R4         ;DO MOVB W/ EVEN BYTE
010366  100404                                  BMI     TS123
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 757           <
010370  012742  000226                          MOV     #226,-(R2)      ;MOVE TO MAILBOX #  *******  226  *******
010374  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010376  000000                                  HALT                    ;MOVB SHOULD SIGN X-TEND
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 1 DOP INSTRUCTIONS WHICH REFERENCE
                                        ;ODD BYTES.  LOC. 0 IS SET TO 177400.  R0 IS SET TO 0 AND R4 IS
                                        ;SET TO 1.  THE BISB INSTRUCTION USES THE DATA IN BYTE 1 TO SET BYTE 0.
                                        ;THE RESULT IS CHECKED BY INCREMENTING THE WORD (LOC. 0) TO ZERO.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 123       TEST MODE 1-ODD BYTE W/ DOP INSTS.
                                        ;*******************************************************************
010400  005212                          TS123:  INC     (R2)            ;UPDATE TEST NUMBER
010402  022712  000123                          CMP     #123,(R2)       ;SEQUENCE ERROR?
010406  001010                                  BNE     TS124-10        ;BR TO ERROR HALT ON SEQ ERROR
010410  005000                                  CLR     R0              ;R0=0
010412  005010                                  CLR     (R0)            ;LOC. 0=0
010414  005004                                  CLR     R4              ;R4=0
010416  005204                                  INC     R4              ;R4=1
010420  105114                                  COMB    (R4)            ;LOC. 0=177400
010422  151410                                  BISB    (R4),(R0)       ;TRY TO BIS LOW ORDER BITS W/ MODE 1
010424  005210                                  INC     (R0)            ;CHECK RESULT
010426  001404                                  BEQ     TS124
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 767           <====
010430  012742  000227                          MOV     #227,-(R2)      ;MOVE TO MAILBOX #  *******  227  *******
010434  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010436  000000                                  HALT                    ;RESULT OF BISB INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 2 DOP INSTRUCTIONS.  LOC. 0 IS SET TO -1.
                                        ;R0 IS CLEARED AND USED AS THE MODE 2 ADDRESSING REGISTER TO MOVE LOC. 0
                                        ;TO R7.  THE DATA RESULTS ARE VERIFIED AND THE INCREMENTING OF THE REGISTER
                                        ;IS CHECKED.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 124       TEST MODE 2 W/ DOP INSTS.
                                        ;*******************************************************************
010440  005212                          TS124:  INC     (R2)            ;UPDATE TEST NUMBER
010442  022712  000124                          CMP     #124,(R2)       ;SEQUENCE ERROR?
010446  001015                                  BNE     TS125-10        ;BR TO ERROR HALT ON SEQ ERROR
010450  005000                                  CLR     R0              ;R0-0
010452  005010                                  CLR     (R0)            ;LOC. 0=0
010454  005110                                  COM     (R0)            ;LOC. 0=177777
010456  012004                                  MOV     (R0)+,R4        ;TRY MOVE MODE 2,0
010460  005204                                  INC     R4              ;CHECK R4
010462  001404                                  BEQ     DOP2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <== -
                                                                        ;           CONDITIONAL BRANCH INST. AND   <= --
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <- -
                                                                        ;           WHICH FOLLOWS W/ 771           <
010464  012742  000230                          MOV     #230,-(R2)      ;MOVE TO MAILBOX #  *******  230  *******
010470  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010472  000000                                  HALT                    ;RESULT OF MOV INST INCORRECT
010474  005300                          DOP2:   DEC     R0              ;TEST R0 AFTER MODE 2
010476  005300                                  DEC     R0
010500  001404                                  BEQ     TS125
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 762           <
010502  012742  000231                          MOV     #231,-(R2)      ;MOVE TO MAILBOX #  *******  231  *******
010506  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010510  000000                                  HALT                    ;REGISTER NOT INCREMENTED IN MODE 2
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 2 DOP BYTE INSTRUCTIONS WHICH ADDRESS
                                        ;EVEN BYTES.  LOC. 0 IS SET TO -1.  R0 IS CLEARED AND USED AS THE
                                        ;ADDRESSING REGISTER IN A TEST WHICH TRIES TO CLEAR BYTE 1 USING
                                        ;BYTE 0 DATA AND A BICB.  UNIQUE IN THIS TEST IS USE OF THE
                                        ;SAME ADDRESSING REGISTER FOR BOTH SOURCE AND DESTINATION.  THE SOURCE AND
                                        ;DESTINATION IS CHECKED TO INSURE PROPER FUNCTIONING.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 125       TEST MODE 2 - EVEN BYTE W/ DOP INST.
                                        ;*******************************************************************************
010512  005212                          TS125:  INC     (R2)            ;UPDATE TEST NUMBER
010514  022712  000125                          CMP     #125,(R2)       ;SEQUENCE ERROR?
010520  001016                                  BNE     TS126-10        ;BR TO ERROR HALT ON SEQ ERROR
010522  005000                                  CLR     R0              ;R0=0
010524  010010                                  MOV     R0,(R0)         ;LOC. 0=0
010526  005110                                  COM     (R0)            ;LOC. 0=177777
010530  142010                                  BICB    (R0)+,(R0)      ;TRY TO CLEAR BYTE 1 FROM BYTE 0 W/ BICB
010532  105737  000001                          TSTB    @#1             ;CHECK RESULT
010536  001404                                  BEQ     DOPB2A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-=--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <- --
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-=--
                                                                        ;           WHICH FOLLOWS W/ 770            <   --
010540  012742  000232                          MOV     #232,-(R2)      ;MOVE TO MAILBOX #  *******  232  *******
010544  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010546  000000                                  HALT                    ;BICB DESTINATION INCORRECT
010550  105137  000000                  DOPB2A: COMB    @#0             ;CHECK BICB SOURCE
010554  001404                                  BEQ     TS126
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 761            <
010556  012742  000233                          MOV     #233,-(R2)      ;MOVE TO MAILBOX #  *******  233  *******
010562  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010564  000000                                  HALT                    ;BICB SOURCE INCORRECTLY CHANGED
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 2 DOP BYTE INSTRUCTIONS WHICH REFERENCE
                                        ;ODD BYTES.  R0 IS SET TO 1, LOC. 0 IS SET TO 177400, AND R4 IS CLEARED.
                                        ;A MODE 2 MOVB USES R0 TO MOVE BYTE 1 TO R4.  AN INCREMENT
                                        ;IS USED TO CHECK THAT THE PROPER BYTE WAS MOVED AND SIGN X-TENDED.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 126       TEST MODE 2 - ODD BYTE W/ DOP INST.
                                        ;*******************************************************************
010566  005212                          TS126:  INC     (R2)            ;UPDATE TEST NUMBER
010570  022712  000126                          CMP     #126,(R2)       ;SEQUENCE ERROR?
010574  001017                                  BNE     TS127-10        ;BR TO ERROR HALT ON SEQ ERROR
010576  005000                                  CLR     R0              ;R0=0
010600  005004                                  CLR     R4              ;R4=0
010602  005010                                  CLR     (R0)            ;LOC. 0=0
010604  005110                                  COM     (R0)            ;LOC. 0=177777
010606  105120                                  COMB    (R0)+           ;LOC 0=177400; R0=1
010610  112004                                  MOVB    (R0)+,R4        ;TRY DOP MODE 2 W/ ODD BYTE
010612  005204                                  INC     R4              ;CHECK RESULT OF MOVB
010614  001404                                  BEQ     DOPB2B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---
                                                                        ;           CONDITIONAL BRANCH INST. AND    <-===
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <---=
                                                                        ;           WHICH FOLLOWS W/ 767            <==--=
010616  012742  000234                          MOV     #234,-(R2)      ;MOVE TO MAILBOX #  *******  234  *******
010622  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010624  000000                                  HALT                    ;RESULT OF MOVB INCORRECT
010626  005740                          DOPB2B: TST     -(R0)           ;BUMP R0 DOWN BY 2
010630  005700                                  TST     R0              ;CHECK R0
010632  001404                                  BEQ     TS127
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==-=
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 760            <-_--
010634  012742  000235                          MOV     #235,-(R2)      ;MOVE TO MAILBOX #  *******  235  *******
010640  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010642  000000                                  HALT                    ;MODE 2 BYTE DID NOT INCREMENT REG. CORRECTLY
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 3 DOUBLE-OPERAND INSTRUCTIONS.
                                        ;LOC. 0 IS LOADED WITH ALTERNATING ZEROES AND ONES; AND R0 IS LOADED
                                        ;WITH ALTERNATING ONES AND ZEROES.  A MODE 3 BIS IS USED TO SET R0
                                        ;TO -1 BY USING LOC. 0 AS THE SOURCE TO BIS THE ZEROES IN R0.  THE
                                        ;RESULT IS TESTED BY INCREMENTING R0 AND CHECKING FOR ZERO.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 127       TEST MODE 3 W/ DOP INSTS.
                                        ;*******************************************************************************
010644  005212                          TS127:  INC     (R2)            ;UPDATE TEST NUMBER
010646  022712  000127                          CMP     #127,(R2)       ;SEQUENCE ERROR?
010652  001011                                  BNE     TS130-10        ;BR TO ERROR HALT ON SEQ ERROR
010654  012737  052525  000000                  MOV     #052525,@#0     ;MOVE 52525 TO LOC. 0
010662  012700  125252                          MOV     #125252,R0      ;SET ALT. ONE AND ZERO IN R0
010666  053700  000000                          BIS     @#0,R0          ;TRY TO SET ALL OTHER BITS W/ MODE 3
010672  005200                                  INC     R0              ;TEST RESULT
010674  001404                                  BEQ     TS130
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <=====
                                                                        ;           WHICH FOLLOWS W/ 766           <  -
010676  012742  000236                          MOV     #236,-(R2)      ;MOVE TO MAILBOX #  *******  236  *******
010702  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010704  000000                                  HALT                    ;BIS W/ MODE 3 INCORRECT RESULT
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 3 DOUBLE OPERAND BYTE INSTRUCTIONS WHICH
                                        ;ADDRESS EVEN BYTES.  BYTE 0 IS SET TO ALTERNATING 1'S AND 0'S; BYTE 1,
                                        ;ALTERNATING 0'S AND 1'S.  R0 IS CLEARED AND A BISB IS USED TO
                                        ;SET THE LOW BYTE OF R0 TO 252.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 130       TEST MODE 3 - EVEN BYTE W/ DOP INSTS.
                                        ;*******************************************************************************
010706  005212                          TS130:  INC     (R2)            ;UPDATE TEST NUMBER
010710  022712  000130                          CMP     #130,(R2)       ;SEQUENCE ERROR?
010714  001011                                  BNE     TS131-10        ;BR TO ERROR HALT ON SEQ ERROR
010716  012737  052652  000000                  MOV     #52652,@#0      ;MOVE 1'S AND 0' PATTERN TO LOC. 0
010724  005000                                  CLR     R0              ;R0=0
010726  153700  000000                          BISB    @#0,R0          ;TRY R0=252 W/ MODE 3 - EVEN BYTE
010732  022700  000252                          CMP     #252,R0         ;BISB W/ EVEN BYTE SUCCESSFUL?
010736  001404                                  BEQ     TS131
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 766           <
010740  012742  000237                          MOV     #237,-(R2)      ;MOVE TO MAILBOX #  *******  237  *******
010744  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010746  000000                                  HALT                    ;BISB W/ MODE 3 - EVEN BYTE FAILED
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 3 DOUBLE OPERAND BYTE INSTRUCTIONS
                                        ;WHICH ADDRESS ODD BYTES.  THE SAME PROCEDURE USED IN PREVIOUS
                                        ;TEST IS USED HERE.  THIS TIME BYTE 1 IS USED AS THE SOURCE BYTE.
                                        ;THE EXPECTED RESULT IS:  R0 = 125.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 131       TEST MODE 3 - ODD BYTE W/ DOP INSTS.
                                        ;*******************************************************************
010750  005212                          TS131:  INC     (R2)            ;UPDATE TEST NUMBER
010752  022712  000131                          CMP     #131,(R2)       ;SEQUENCE ERROR?
010756  001011                                  BNE     TS132-10        ;BR TO ERROR HALT ON SEQ ERROR
010760  012737  052652  000000                  MOV     #52652,@#0      ;MOVE 1'S AND 0'S PATTERN TO LOC 0
010766  005000                                  CLR     R0              ;R0=0
010770  153700  000001                          BISB    @#1,R0          ;TRY R0=152 W/ MODE 3 - ODD BYTE
010774  022700  000125                          CMP     #125,R0         ;R0=125?
011000  001404                                  BEQ     TS132
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 766           <-
011002  012742  000240                          MOV     #240,-(R2)      ;MOVE TO MAILBOX #  *******  240  *******
011006  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011010  000000                                  HALT                    ;BISB W/ MODE 3 - ODD BYTE FAILED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************
                                        ;TEST 132       TEST DEST. MODE 0-BYTE W/ DOP NON-MODIFYING MST
                                        ;*******************************************************************
011012  005212                          TS132:  INC     (R2)            ;UPDATE TEST NUMBER
011014  022712  000132                          CMP     #132,(R2)       ;SEQUENCE ERROR?
011020  001017                                  BNE     TS133-10        ;BR TO ERROR HALT ON SEQ ERROR
011022  005000                                  CLR     R0              ;R0=0
011024  105100                                  COMB    R0              ;R0=377
011026  000263                                  +SEC!SEV                ;SET C AND V BITS
011030  132700  000200                          BITB    #200,R0         ;TRY DOPNM DEST. MODE 0-BYTE
011034  001403                                  BEQ     DNMB0A          ;BR TO ERROR IF Z BIT SET
011036  102402                                  BVS     DNMB0A          ;BR TO ERROR IF V BIT SET
011040  103001                                  BCC     DNMB0A          ;BR TO ERROR IF C BIT CLEAR.
011042  100404                                  BMI     DNMB0B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 766           <-
011044                                  DNMB0A:
011044  012742  000241                          MOV     #241,-(R2)      ;MOVE TO MAILBOX #  *******  241  *******
011050  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011052  000000                                  HALT                    ;CC'S INCORRECT
011054  105100                          DNMB0B: COMB    R0              ;CHECK DESTINATION DATA
011056  001404                                  BEQ     TS133
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 760           <-
011060  012742  000242                          MOV     #242,-(R2)      ;MOVE TO MAILBOX #  *******  242  *******
```

```
011064  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011066  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;TEST 133       TEST DEST. MODE 1 W/ DOP NON-MODIFYING INST
                                ;*******************************************************************
011070  005212                  TS133:  INC     (R2)            ;UPDATE TEST NUMBER
011072  022712  000133                  CMP     #133,(R2)       ;SEQUENCE ERROR?
011076  001017                          BNE     TS134-10        ;BR TO ERROR HALT ON SEQ ERROR
011100  005000                          CLR     R0              ;R0=0
011102  005010                          CLR     (R0)            ;LOC. 0=0
011104  000241                          CLC                     ;CLEAR C BIT
011106  032710  177777                  BIT     #177777,(R0)    ;TRY DOPNM DEST. MODE 1
011112  100403                          BMI     DNM1A           ;BR TO ERROR IF N BIT SET
011114  102402                          BVS     DNM1A           ;BR TO ERROR IF V BIT SET
011116  103401                          BCS     DNM1A           ;BR TO ERROR IF C BIT SET
011120  001404                          BEQ     DNM1B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 766           <-
011122                          DNM1A:
011122  012742  000243                  MOV     #243,-(R2)      ;MOVE TO MAILBOX #  *******  243  *******
011126  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011130  000000                          HALT                    ;COND. CODES INCORRECT
011132  005710                  DNM1B:  TST     (R0)            ;CHECK TEST DATA
011134  001404                          BEQ     TS134
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 760           <
011136  012742  000244                  MOV     #244,-(R2)      ;MOVE TO MAILBOX #  *******  244  *******
011142  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011144  000000                          HALT                    ;DESTINATION DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;TEST 134       TEST DEST. MODE 2 W/ DOP NON-MODIFYING INST.
                                ;*******************************************************************
011146  005212                  TS134:  INC     (R2)            ;UPDATE TEST NUMBER
011150  022712  000134                  CMP     #134,(R2)       ;SEQUENCE ERROR?
011154  001027                          BNE     TS135-10        ;BR TO ERROR HALT ON SEQ ERROR
011156  005000                          CLR     R0              ;R0-0
011160  005010                          CLR     (R0)            ;LOC. 0=0
011162  052710  125252                  BIS     #125252,(R0)    ;LOC. 0=125252
011166  032720  077777                  BIT     #77777,(R0)+    ;TRY DOPNM INST W/ MODE 2
011172  102402                          BVS     DNM2A           ;BR TO ERROR IF V BIT SET
011174  001401                          BEQ     DNM2A           ;BR TO ERROR IF Z-BIT SET
011176  100004                          BPL     DNM2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <
011200                          DNM2A:
011200  012742  000245                  MOV     #245,-(R2)      ;MOVE TO MAILBOX #  *******  245  *******
```

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011204  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011206  000000                          HALT                    ;COND. CODES INCORRECT
011210  005300                  DNM2B:  DEC     R0              ;DECREMENT R0 TO CHECK IT.
011212  005300                          DEC     R0
011214  001404                          BEQ     DNM2D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---
                                                                ;           CONDITIONAL BRANCH INST. AND    <--=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <---=
                                                                ;           WHICH FOLLOWS W/ 757            <
011216                          DNM2C:
011216  012742  000246                  MOV     #246,-(R2)      ;MOVE TO MAILBOX #  *******  246  *******
011222  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011224  000000                          HALT                    ;MODE 2 REGISTER NOT INCREMENTED BY 2
011226  022710  125252          DNM2D:  CMP     #125252,(R0)    ;CHECK DEST. DATA
011232  001404                          BEQ     TS135
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=--
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 750            <--
011234  012742  000247                  MOV     #247,-(R2)      ;MOVE TO MAILBOX #  *******  247  *******
011240  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011242  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 135       TEST DEST. MODE 2-BYTE, W/DOP NON-MODIFYING INST
                                ;*******************************************************************************
011244  005212                  TS135:  INC     (R2)            ;UPDATE TEST NUMBER
011246  022712  000135                  CMP     #135,(R2)       ;SEQUENCE ERROR?
011252  001051                          BNE     TS136-10        ;BR TO ERROR HALT ON SEQ ERROR
011254  005000                          CLR     R0              ;R0=0
011256  005010                          CLR     (R0)            ;LOC. 0=0
011260  052710  052652                  BIS     #52652,(R0)     ;LOC. 0=52652
011264  000263                          +SEC!SEV                ;SET C AND V BITS
011266  132720  000201                  BITB    #201,(R0)+      ;TRY DOPNM INST. W/ MODE 2 EVEN BYTE
011272  001403                          BEQ     DNMB2A          ;BR TO ERROR IF Z-BIT SET
011274  103002                          BCC     DNMB2A          ;BR TO ERROR IF C-BIT CLEAR
011276  102401                          BVS     DNMB2A          ;BR TO ERROR IF V-BIT SET
011300  100404                          BMI     DNMB2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <- -
                                                                ;           WHICH FOLLOWS W/ 764            <-
011302                          DNMB2A:
011302  012742  000250                  MOV     #250,-(R2)      ;MOVE TO MAILBOX #  *******  250  *******
011306  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011310  000000                          HALT                    ;COND. CODES INCORRECT
011312  005300                  DNMB2B: DEC     R0              ;CHECK DEST. REGISTER.
011314  001404                          BEQ     DNMB2C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=-
                                                                ;           CONDITIONAL BRANCH INST. AND    <==-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 756            <
011316  012742  000251                  MOV     #251,-(R2)      ;MOVE TO MAILBOX #  *******  251  *******
011322  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011324  000000                          HALT                    ;DEST. REGISTER NOT INCREMENTED BY 1
```

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011326  005200                  DNMB2C: INC     R0              ;R0=1
011330  132720  000201                  BITB    #201,(R0)+      ;TRY DOPNM INST. W/MODE 2-ODD BYTE
011334  001402                          BEQ     DNMB2D  ;BR TO ERROR IF Z-BIT SET
011336  102401                          BVS     DNMB2D          ;BR TO ERROR IF V-BIT SET
011340  100004                          BPL     DNMB2E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 744           <====
011342                          DNMB2D:
011342  012742  000252                  MOV     #252,-(R2)      ;MOVE TO MAILBOX #  *******  252  *******
011346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011350  000000                          HALT                    ;COND. CODES INCORRECT
011352  005300                  DNMB2E: DEC     R0              ;DEC R0 TO CHECK IT.
011354  005300                          DEC     R0
011356  001404                          BEQ     DNMB2F
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 735           <====
011360  012742  000253                  MOV     #253,-(R2)      ;MOVE TO MAILBOX #  *******  253  *******
011364  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011366  000000                          HALT                    ;DEST. REGISTER NOT INCREMENTED BY 1
011370  022710  052652          DNMB2F: CMP     #52652,(R0)     ;CHECK DEST. DATA IS UNMODIFIED
011374  001404                          BEQ     TS136
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 726           <====
011376  012742  000254                  MOV     #254,-(R2)      ;MOVE TO MAILBOX #  *******  254  *******
011402  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011404  000000                          HALT                    ;DEST. DATA WAS MODIFIED.
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 136       TEST DEST. MODE 3-BYTES W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011406  005212                  TS136:  INC     (R2)            ;UPDATE TEST NUMBER
011410  022712  000136                  CMP     #136,(R2)       ;SEQUENCE ERROR?
011414  001050                          BNE     TS137-10        ;BR TO ERROR HALT ON SEQ ERROR
011416  005000                          CLR     R0              ;R0=0
011420  005010                          CLR     (R0)            ;LOC. 0=0
011422  052710  125125                  BIS     #125125,(R0)    ;LOC. 0=125125
011426  105100                          COMB    R0              ;R0=377
011430  005200                          INC     R0              ;R0=400
011432  005010                          CLR     (R0)            ;LOC. 400=0
011434  000263                          +SEC!SEV                ;C-BIT=V-BIT=1
011436  132730  000201                  BITB    #201,@(R0)+     ;TRY DOPNM W/MODE 3-EVEN BYTE
011442  001403                          BEQ     DNMB3A          ;BR TO ERROR IF Z BIT SET
011444  102402                          BVS     DNMB3A          ;BR TO ERROR IF V BIT SET
011446  103001                          BCC     DNMB3A          ;BR TO ERROR IF C BIT CLEAR
011450  100004                          BPL     DNMB3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
```

```
                                                                ;           WHICH FOLLOWS W/ 761          <====
011452                          DNMB3A:
011452  012742  000255                  MOV     #255,-(R2)      ;MOVE TO MAILBOX #  *******  255  *******
011456  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011460  000000                          HALT                    ;COND. CODES INCORRECT
011462  022700  000402          DNMB3B: CMP     #402,R0         ;CHECK DEST. REGISTER INC. BY 2 AND INC BY 2 AGAIN
011466  001404                          BEQ     DNMB3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 752           <====
011470  012742  000256                  MOV     #256,-(R2)      ;MOVE TO MAILBOX #  *******  256  *******
011474  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011476  000000                          HALT                    ;DEST. REGISTER NOT INCREMENTED BY 2
011500  005200                  DNMB3C: INC     R0              ;R0=404
011502  005200                          INC     R0
011504  132730  000201                  BITB    #201,@(R0)+     ;TRY DOPNM DEST MODE 3-BYTE(ODD)
011510  001402                          BEQ     DNMB3D          ;BR TO ERROR IF Z BIT SET
011512  102401                          BVS     DNMB3D          ;BR TO ERROR IF V BIT SET
011514  100404                          BMI     DNMB3E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 737           <====
011516                          DNMB3D:
011516  012742  000257                  MOV     #257,-(R2)      ;MOVE TO MAILBOX #  *******  257  *******
011522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011524  000000                          HALT                    ;COND. CODES INCORRECT
011526  005004                  DNMB3E: CLR     R4              ;R4=0
011530  022714  125125                  CMP     #125125,(R4)    ;CHECK DEST. DATA
011534  001404                          BEQ     TS137
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 727           <====
011536  012742  000260                  MOV     #260,-(R2)      ;MOVE TO MAILBOX #  *******  260  *******
011542  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011544  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 137       TEST DEST. MODE 4 W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011546  005212                  TS137:  INC     (R2)            ;UPDATE TEST NUMBER
011550  022712  000137                  CMP     #137,(R2)       ;SEQUENCE ERROR?
011554  001033                          BNE     TS140-10        ;BR TO ERROR HALT ON SEQ ERROR
011556  005000                          CLR     R0              ;R0=0
011560  005010                          CLR     (R0)            ;LOC. 0=0
011562  052710  125252                  BIS     #125252,(R0)    ;LOC. 0=125125
011566  052700  000002                  BIS     #2,R0           ;R0=2
011572  000277                          SCC                     ;SET ALL COND. CODE BITS
011574  032740  020000                  BIT     #20000,-(R0)    ;TRY DOPNM W/ MODE 4
011600  100403                          BMI     DNM4A           ;BR TO ERROR IF N-BIT SET
011602  102402                          BVS     DNM4A           ;BR TO ERROR IF V-BIT SET
011604  103001                          BCC     DNM4A           ;BR TO ERROR IF C-BIT CHAR
011606  001004                          BNE     DNM4B
```

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                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 762            <====
011610                          DNM4A:
011610  012742  000261                  MOV     #261,-(R2)      ;MOVE TO MAILBOX #  *******  261  *******
011614  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011616  000000                          HALT                    ;COND. CODES INCORRECT
011620  005700                  DNM4B:  TST     R0              ;CHECK DEST. REGISTER
011622  001404                          BEQ     DNM4C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 754            <====
011624  012742  000262                  MOV     #262,-(R2)      ;MOVE TO MAILBOX #  *******  262  *******
011630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011632  000000                          HALT                    ;DEST. REGISTER NOT DECREMENTED BY 2
011634  022737  125252  000000  DNM4C:  CMP     #125252,@#0     ;CHECK DEST. DATA
011642  001404                          BEQ     TS140
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
011644  012742  000263                  MOV     #263,-(R2)      ;MOVE TO MAILBOX #  *******  263  *******
011650  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011652  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 140       TEST DEST. MODE 4-BYTE W/ DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011654  005212                  TS140:  INC     (R2)            ;UPDATE TEST NUMBER
011656  022712  000140                  CMP     #140,(R2)       ;SEQUENCE ERROR?
011662  001051                          BNE     TS141-10        ;BR TO ERROR HALT ON SEQ ERROR
011664  005000                          CLR     R0              ;R0=0
011666  005010                          CLR     (R0)            ;LOC. 0=0
011670  052710  052652                  BIS     #52652,(R0)     ;LOC. 0=52652
011674  052700  000002                  BIS     #2,R0           ;R0=2
011700  000257                          CCC                     ;COND. CODES=0
011702  132740  000201                  BITB    #201,-(R0)      ;TRY DOPNM INST W/MODE 4 ODD BYTE
011706  102403                          BVS     DNMB4A          ;BR TO ERROR IF V BIT SET
011710  001402                          BEQ     DNMB4A  ;BR TO ERROR IF Z BIT SET
011712  103401                          BCS     DNMB4A          ;BR TO ERROR IF C BIT SET
011714  001004                          BNE     DNMB4B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===
                                                                        ;           CONDITIONAL BRANCH INST. AND    <===
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <===
                                                                        ;           WHICH FOLLOWS W/ 762            <===
011716                          DNMB4A:
011716  012742  000264                  MOV     #264,-(R2)      ;MOVE TO MAILBOX #  *******  264  *******
011722  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011724  000000                          HALT                    ;COND. CODES INCORRECT
011726  022700  000001          DNMB4B: CMP     #1,R0           ;CHECK DEST. REGISTER
011732  001404                          BEQ     DNMB4C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===
                                                                        ;           CONDITIONAL BRANCH INST. AND    <===
```

```
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 753           <====
011734  012742  000265                  MOV     #265,-(R2)      ;MOVE TO MAILBOX #  *******  265  *******
011740  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011742  000000                          HALT                    ;DEST REG. NOT DECREMENTED BY 1
011744  132740  000201          DNMB4C: BITB    #201,-(R0)      ;TRY DOPNM INST. W/MODE 4 EVEN BYTE
011750  001401                          BEQ     DNMB4D          ;BR TO ERROR IF 7-BIT SET
011752  100404                          BMI     DNMB4E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 743           <====
011754                          DNMB4D:
011754  012742  000266                  MOV     #266,-(R2)      ;MOVE TO MAILBOX #  *******  266  *******
011760  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011762  000000                          HALT                    ;COND. CODES INCORRECT
011764  005700                  DNMB4E: TST     R0              ;CHECK DEST. REGISTER
011766  001404                          BEQ     DNMB4F
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 735           <====
011770  012742  000267                  MOV     #267,-(R2)      ;MOVE TO MAILBOX #  *******  267  *******
011774  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011776  000000                          HALT                    ;DEST. REG. NOT DECREMENTED BY 1
012000  022710  052652          DNMB4F: CMP     #52652,(R0)     ;CHECK DESTINATION DATA
012004  001404                          BEQ     TS141
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 726           <====
012006  012742  000270                  MOV     #270,-(R2)      ;MOVE TO MAILBOX #  *******  270  *******
012012  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012014  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 141       TEST DEST MODE 5 W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
012016  005212                  TS141:  INC     (R2)            ;UPDATE TEST NUMBER
012020  022712  000141                  CMP     #141,(R2)       ;SEQUENCE ERROR?
012024  001034                          BNE     TS142-10        ;BR TO ERROR HALT ON SEQ ERROR
012026  005000                          CLR     R0              ;R0=0
012030  005010                          CLR     (R0)            ;LOC 0=0
012032  052710  100000                  BIS     #100000,(R0)    ;LOC. 0=100000
012036  052700  000402                  BIS     #402,R0         ;R0=2
012042  000277                          SCC                     ;SET ALL COND. CODE BITS
012044  032750  100000                  BIT     #100000,@-(R0)  ;TRY DOPNM W/MODE 5
012050  102403                          BVS     DNM5A           ;BR TO ERROR IF V-BIT SET
012052  103002                          BCC     DNM5A           ;BR TO ERROR IF C-BIT CLEAR
012054  001401                          BEQ     DNM5A           ;BR TO ERROR IF Z-BIT SET
012056  100404                          BMI     DNM5B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 762           <====
```

```
012060                          DNM5A:
012060  012742  000271                  MOV     #271,-(R2)      ;MOVE TO MAILBOX #  *******  271  *******
012064  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012066  000000                          HALT                    ;COND. CODES INCORRECT
012070  022700  000400          DNM5B:  CMP #400,R0             ;CHECK DEST. REGISTER
012074  001404                          BEQ     DNM5C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 753           <====
012076  012742  000272                  MOV     #272,-(R2)      ;MOVE TO MAILBOX #  *******  272  *******
012102  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012104  000000                          HALT                    ;DEST. REGISTER NOT DECREMENTED BY 2
012106  022737  100000  000000  DNM5C:  CMP     #100000,@#0     ;CHECK DESTINATION DATA
012114  001404                          BEQ     TS142
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 743           <
012116  012742  000273                  MOV     #273,-(R2)      ;MOVE TO MAILBOX #  *******  273  *******
012122  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012124  000000                          HALT                    ;DEST. DATA INCORRECTLY MODIFIED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 142       TEST DEST. MODE 6 W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
012126  005212                  TS142:  INC     (R2)            ;UPDATE TEST NUMBER
012130  022712  000142                  CMP     #142,(R2)       ;SEQUENCE ERROR?
012134  001033                          BNE     TS143-10        ;BR TO ERROR HALT ON SEQ ERROR
012136  005000                          CLR     R0              ;R0=0
012140  005010                          CLR     (R0)            ;LOC> 0=0
012142  052710  000001                  BIS     #1,(R0)         ;LOC. 0=1
012146  005100                          COM     R0              ;R0=-1 C-BIT-1
012150  032760  000001  000001          BIT     #1,1(R0)        ;TRY DOPNM W/MODE 6
012156  001403                          BEQ     DNM6A           ;BR TO ERROR IF Z-BIT SET
012160  102402                          BVS     DNM6A           ;BR TO ERROR IF V-BIT SET
012162  103001                          BCC     DNM6A           ;BR TO ERROR IF C-BIT CLEAR
012164  100004                          BPL     DNM6B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 763           <
012166                          DNM6A:
012166  012742  000274                  MOV     #274,-(R2)      ;MOVE TO MAILBOX #  *******  274  *******
012172  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012174  000000                          HALT                    ;COND CODES INCORRECT
012176  022700  177777          DNM6B:  CMP     #-1,R0          ;CHECK DEST. REGISTER
012202  001404                          BEQ     DNM6C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 754           <
012204  012742  000275                  MOV     #275,-(R2)      ;MOVE TO MAILBOX #  *******  275  *******
012210  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012212  000000                          HALT                    ;DEST. REGISTER MODIFIED
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012214  022737  000001  000000  DNM6C:  CMP     #1,@#0          ;CHECK DEST. DATA
012222  001404                          BEQ     TS143
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=--
                                                                ;           CONDITIONAL BRANCH INST. AND    <=---=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=--
                                                                ;           WHICH FOLLOWS W/ 744            <=--=
012224  012742  000276                  MOV     #276,-(R2)      ;MOVE TO MAILBOX #  *******  276  *******
012230  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012232  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 143       TEST DEST MODE 7 W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
012234  005212                  TS143:  INC     (R2)            ;UPDATE TEST NUMBER
012236  022712  000143                  CMP     #143,(R2)       ;SEQUENCE ERROR?
012242  001034                          BNE     TS144-10        ;BR TO ERROR HALT ON SEQ ERROR
012244  005000                          CLR     R0              ;R0=0
012246  005010                          CLR     (R0)            ;LOC. 0=0 C-BIT=0
012250  052710  125125                  BIS     #125125,(R0)    ;LOC. 0=125125
012254  052700  000001                  BIS     #1,R0           ;R0=1
012260  132770  000125  000403          BITB    #125,@403(R0)   ;TRY DOPNM W/MODE 7
012266  102403                          BVS     DNM7A           ;BR TO ERROR IF V-BIT SET
012270  100402                          BMI     DNM7A           ;BR TO ERROR IF N-BIT SET
012272  103401                          BCS     DNM7A           ;BR TO ERROR IF C-BIT SET
012274  001404                          BEQ     DNM7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 762            <
012276                          DNM7A:
012276  012742  000277                  MOV     #277,-(R2)      ;MOVE TO MAILBOX #  *******  277  *******
012302  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012304  000000                          HALT                    ;COND. CODES INCORRECT
012306  022700  000001          DNM7B:  CMP     #1,R0           ;CHECK DEST. REGISTER
012312  001404                          BEQ     DNM7C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 753            <
012314  012742  000300                  MOV     #300,-(R2)      ;MOVE TO MAILBOX #  *******  300  *******
012320  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012322  000000                          HALT                    ;DESTINATION REGISTER MODIFIED
012324  022737  125125  000000  DNM7C:  CMP     #125125,@#0     ;CHECK DEST. DATA
012332  001404                          BEQ     TS144
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=
                                                                ;           WHICH FOLLOWS W/ 743            <
012334  012742  000301                  MOV     #301,-(R2)      ;MOVE TO MAILBOX #  *******  301  *******
012340  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012342  000000                          HALT                    ;DEST. DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
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                                        ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 1 INSTRUCTION.
                                        ;DATA IS SET IN R0 USING SOP INSTRUCTIONS AND THEN MOVED TO LOC. 0
                                        ;USING MOV SRC MODE 0, DEST. MODE 1.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 144       TEST MOV DESTINATION MODE 1
                                        ;*******************************************************************
012344  005212                          TS144:  INC     (R2)            ;UPDATE TEST NUMBER
012346  022712  000144                          CMP     #144,(R2)       ;SEQUENCE ERROR?
012352  001016                                  BNE     TS145-10        ;BR TO ERROR HALT ON SEQ ERROR
012354  005000                                  CLR     R0              ;R0=0
012356  005010                                  CLR     (R0)            ;LOC. 0=0
012360  005100                                  COM     R0              ;R0=-1
012362  005004                                  CLR     R4              ;R4 POINTS TO LOC. 0
012364  010014                                  MOV     R0,(R4)         ;TRY MOVE MODE 0,1
012366  102402                                  BVS     MDM1A           ;BR TO ERROR IF V SET
012370  001401                                  BEQ     MDM1A           ;BR TO ERROR IF Z SET
012372  100404                                  BMI     MDM1B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 767           <
012374                                  MDM1A:
012374  012742  000302                          MOV     #302,-(R2)      ;MOVE TO MAILBOX #  *******  302  *******
012400  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012402  000000                                  HALT                    ;CONDITION CODE NOT CORRECT
012404  005704                          MDM1B:  TST     R4
012406  001404                                  BEQ     TS145
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 761           <
012410  012742  000303                          MOV     #303,-(R2)      ;MOVE TO MAILBOX #  *******  303  *******
012414  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012416  000000                                  HALT                    ;DESTINATION REGISTER INCORRECTLY ALTERED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 2 INSTRUCTION.
                                        ;       DATA IS SET IN R0 USING SOP INSTRUCTIONS AND THEN MOVED
                                        ;       TO LOCATION 0 USING MOV SRC MODE 0, DEST. MODE 1.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 145       TEST MOV DESTINATION MODE 2
                                        ;*******************************************************************
012420  005212                          TS145:  INC     (R2)            ;UPDATE TEST NUMBER
012422  022712  000145                          CMP     #145,(R2)       ;SEQUENCE ERROR?
012426  001026                                  BNE     TS146-10        ;BR TO ERROR HALT ON SEQ ERROR
012430  005000                                  CLR     R0              ;R0=0
012432  005001                                  CLR     R1              ;R1=0
012434  005010                                  CLR     (R0)            ;LOC.0=0
012436  005110                                  COM     (R0)            ;LOC. 0=-1
012440  010120                                  MOV     R1,(R0)+        ;TRY MOVE MODE 0,2
012442  100402                                  BMI     MDM2A           ;BR TO ERROR IF N SET
012444  102401                                  BVS     MDM2A           ;BR TO ERROR IF V SET
```

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012446  001404                          BEQ     MDM2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 767           <====
012450                          MDM2A:
012450  012742  000304                  MOV     #304,-(R2)      ;MOVE TO MAILBOX #  *******  304  *******
012454  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012456  000000                          HALT                    ;CC'S INCORRECT
012460  005300                  MDM2B:  DEC     R0
012462  005300                          DEC     R0
012464  001404                          BEQ     MDM2D
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 760           <====
012466                          MDM2C:
012466  012742  000305                  MOV     #305,-(R2)      ;MOVE TO MAILBOX #  *******  305  *******
012472  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012474  000000                          HALT                    ;DESTINATION REGISTER NOT INCREMENTED PROPERLY
012476  005737  000000          MDM2D:  TST     @#0
012502  001404                          BEQ     TS146
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 751           <====
012504  012742  000306                  MOV     #306,-(R2)      ;MOVE TO MAILBOX #  *******  306  *******
012510  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012512  000000                          HALT                    ;DESTINATION DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES DESTINATION MODE 2 W/MOVB INSTS. TWO DIFFERENT MOVB
                                ;INSTRUCTIONS ARE USED TO MOVE A TEST PATTERN FIRST TO BYTE 0 THEN TO BYTE 1.
                                ;
                                ;*******************************************************************************
                                ;TEST 146       TEST MOV-BYTE DESTINATION MODE 2
                                ;*******************************************************************************
012514  005212                  TS146:  INC     (R2)            ;UPDATE TEST NUMBER
012516  022712  000146                  CMP     #146,(R2)       ;SEQUENCE ERROR?
012522  001046                          BNE     TS147-10        ;BR TO ERROR HALT ON SEQ ERROR
012524  005000                          CLR     R0              ;R0=0
012526  005010                          CLR     (R0)            ;LOC. 0=0
012530  112720  000125                  MOVB    #125,(R0)+      ;TRY DESTINATION MODE 2 W/EVEN BYTE
012534  102402                          BVS     MBDM2A          ;BR TO ERROR IF V SET
012536  001401                          BEQ     MBDM2A          ;BR TO ERROR IF Z SET
012540  100004                          BPL     MBDM2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 770           <====
012542                          MBDM2A:
012542  012742  000307                  MOV     #307,-(R2)      ;MOVE TO MAILBOX #  *******  307  *******
012546  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012550  000000                          HALT                    ;CC'S INCORRECT
```

```
012552  022700  000001          MBDM2B: CMP     #1,R0
012556  001404                          BEQ     MBDM2C
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---=
                                                        ;           CONDITIONAL BRANCH INST. AND    <=-==
                                                        ;           REPLACE THE MOVE INSTRUCTION    <---=
                                                        ;           WHICH FOLLOWS W/ 761            <---=
012560  012742  000310                  MOV     #310,-(R2)      ;MOVE TO MAILBOX #  *******  310  *******
012564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012566  000000                          HALT                    ;REGISTER NOT INCREMENTED BY ONE
012570  112720  000252          MBDM2C: MOVB    #252,(R0)+      ;TRY DESTINATION MODE 2 W/ODD BYTE
012574  102402                          BVS     MBDM2D
012576  001401                          BEQ     MBDM2D
012600  100404                          BMI     MBDM2E
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---=
                                                        ;           CONDITIONAL BRANCH INST. AND    <=-==
                                                        ;           REPLACE THE MOVE INSTRUCTION    <---=
                                                        ;           WHICH FOLLOWS W/ 750            <---=
012602                          MBDM2D:
012602  012742  000311                  MOV     #311,-(R2)      ;MOVE TO MAILBOX #  *******  311  *******
012606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012610  000000                          HALT                    ;CC'S NOT SET CORRECT
012612  022700  000002          MBDM2E: CMP     #2,R0
012616  001404                          BEQ     MBDM2F
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==-=
                                                        ;           CONDITIONAL BRANCH INST. AND    <===-
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 741            <=--=
012620  012742  000312                  MOV     #312,-(R2)      ;MOVE TO MAILBOX #  *******  312  *******
012624  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012626  000000                          HALT                    ;REGISTER NOT INCREMENTED BY ONE
012630  022737  125125  000000  MBDM2F: CMP     #125125,@#0     ;CHECK DATA
012636  001404                          BEQ     TS147
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--=
                                                        ;           CONDITIONAL BRANCH INST. AND    <-===
                                                        ;           REPLACE THE MOVE INSTRUCTION    <--=
                                                        ;           WHICH FOLLOWS W/ 731            <==-=
012640  012742  000313                  MOV     #313,-(R2)      ;MOVE TO MAILBOX #  *******  313  *******
012644  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012646  000000                          HALT                    ;DESTINATION DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MOV DESTINATION MODE 3. R0 IS USED TO PICK UP
                                ;AN ADDRESS AT LOC. 400. LOC 400 POINTS TO LOC. 0 THE EFFECTIVE DEST. ADDR.. ALSO, MOVB
                                ;INST. ARE USED W/ EVEN AND ODD BYTES TO CHECK MOV BYTES INST AND MODE 37 DESTINATIONS.
                                ;*******************************************************************
                                ;TEST 147       TEST MOV(B) DESTINATION MODE 3
                                ;*******************************************************************
012650  005212                  TS147:  INC     (R2)            ;UPDATE TEST NUMBER
012652  022712  000147                  CMP     #147,(R2)       ;SEQUENCE ERROR?
012656  001057                          BNE     TS150-10        ;BR TO ERROR HALT ON SEQ ERROR
012660  012700  000400                  MOV     #400,R0         ;R0=400
012664  005010                          CLR     (R0)            ;LOC. 400 POINTS TO LOC. 0
012666  005037  000000                  CLR     @#0             ;LOC. 0=0
012672  012730  125252                  MOV     #125252,@(R0)+  ;TRY MOV DESTINATION MODE 2
```

```
012676  102402                          BVS     MDM3A           ;BR TO ERROR IF V SET
012700  001401                          BEQ     MDM3A           ;BR TO ERROR IF Z SET
012702  100404                          BMI     MDM3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 765            <
012704                          MDM3A:
012704  012742  000314                  MOV     #314,-(R2)      ;MOVE TO MAILBOX #  *******  314  *******
012710  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012712  000000                          HALT                    ;CC'S INCORRECT
012714  022700  000402          MDM3B:  CMP     #402,R0         ;CHECK DEST. MODE REGISTER
012720  001404                          BEQ     MDM3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 756            <====
012722  012742  000315                  MOV     #315,-(R2)      ;MOVE TO MAILBOX #  *******  315  *******
012726  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012730  000000                          HALT                    ;REGISTER NOT INCREMENTED BY 2
012732  022737  125252  000000  MDM3C:  CMP     #125252,@#0     ;CHECK DESTINATION DATA
012740  001404                          BEQ     MDM3D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 746            <
012742  012742  000316                  MOV     #316,-(R2)      ;MOVE TO MAILBOX #  *******  316  *******
012746  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012750  000000                          HALT                    ;DESTINATION DATA INCORRECT
012752  112737  000125  000000  MDM3D:  MOVB    #125,@#0        ;TRY MOVB DESTINATION MODE 2 EVEN BYTE
012760  022737  125125  000000          CMP     #125125,@#0     ;CHECK DATA
012766  001404                          BEQ     MDM3E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 733            <
012770  012742  000317                  MOV     #317,-(R2)      ;MOVE TO MAILBOX #  *******  317  *******
012774  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012776  000000                          HALT                    ;DESTINATION DATA INCORRECT
013000  112737  000525  000001  MDM3E:  MOVB    #525,@#1        ;TRY MOVB DESTINATION MODE 2 ODD BYTE
013006  022737  052525  000000          CMP     #52525,@#0      ;CHECK DATA
013014  001404                          BEQ     TS150
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 720            <-
013016  012742  000320                  MOV     #320,-(R2)      ;MOVE TO MAILBOX #  *******  320  *******
013022  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013024  000000                          HALT                    ;

                                ;*****************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 4 INSTRUCTION.
                                ;SOP INSTRUCTIONS ON R0 ARE USED TO CLEAR TARGET LOCATION 0.
                                ;R4 IS USED AS THE MODE 4 ADDRESSING REGISTER, AND
                                ;CONDITIONAL BRANCHES ARE USED TO VERIFY THE DATA.
```

```
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 150       TEST MOV DESTINATION MODE 4
                                        ;*******************************************************************************
                                        ;
013026  005212                          TS150:  INC     (R2)            ;UPDATE TEST NUMBER
013030  022712  000150                          CMP     #150,(R2)       ;SEQUENCE ERROR?
013034  001026                                  BNE     TS151-10        ;BR TO ERROR HALT ON SEQ ERROR
013036  005000                                  CLR     R0              ;R0=0
013040  005010                                  CLR     (R0)            ;LOC 0=0
013042  012704  000002                          MOV     #2,R4           ;R4=2
013046  012744  012345                          MOV     #12345,-(R4)    ;TRY MOV DEST. MODE 4
013052  102402                                  BVS     MDM4A           ;BR TO ERROR IF V-BIT SET
013054  001401                                  BEQ     MDM4A           ;BR TO ERROR IF Z-BIT SET
013056  100004                                  BPL     MDM4B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
013060                                  MDM4A:
013060  012742  000321                          MOV     #321,-(R2)      ;MOVE TO MAILBOX #  *******  321  *******
013064  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013066  000000                                  HALT                    ;CC'S NOT CORRECT
013070  005704                          MDM4B:  TST     R4              ;CHECK DECREMENTING OF MODE 4 REG.
013072  001404                                  BEQ     MDM4C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 760           <
013074  012742  000322                          MOV     #322,-(R2)      ;MOVE TO MAILBOX #  *******  322  *******
013100  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013102  000000                                  HALT                    ;DESTINATION MODE REGISTER NOT DECREMENTED BY 2
013104  022710  012345                  MDM4C:  CMP     #12345,(R0)     ;CHECK DESTINATION DATA
013110  001404                                  BEQ     TS151
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <=
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 751           <
013112  012742  000323                          MOV     #323,-(R2)      ;MOVE TO MAILBOX #  *******  323  *******
013116  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013120  000000                                  HALT                    ;DESTINATION DATA INCORRECT
                                                                        ;  OR SEQUENCE ERROR


                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE MOVB DESTINATION MODE 4 INSTRUCTION
                                        ;       ON BOTH ODD AND EVEN BYTES. SOP INSTRUCTIONS ON R4 ARE
                                        ;       USED TO CLEAR TARGET LOCATION 0. R0 IS USED AS THE MODE 4
                                        ;       ADDRESSING REGISTER, AND CMP AND CONDITIONAL BRANCH
                                        ;       INSTRUCTIONS ARE USED TO VERIFY THE DATA.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 151       TEST MOVB DESTINATION MODE 4
                                        ;*******************************************************************************
013122  005212                          TS151:  INC     (R2)            ;UPDATE TEST NUMBER
013124  022712  000151                          CMP     #151,(R2)       ;SEQUENCE ERROR?
013130  001046                                  BNE     TS152-10        ;BR TO ERROR HALT ON SEQ ERROR
```

```
013132  005004                          CLR     R4              ;R4=0
013134  005014                          CLR     (R4)            ;LOC. 0=0
013136  012700  000002                  MOV     #2,R0           ;R0 = 2
013142  112740  125125                  MOVB    #125125,-(R0)   ;TRY MOVB DEST. MODE 4-ODD BYTE
013146  020027  000001                  CMP     R0,#1           ;CHECK THAT DEST. REG. WAS DECREMENTED
013152  001404                          BEQ     MBDM4A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <
013154  012742  000324                  MOV     #324,-(R2)      ;MOVE TO MAILBOX #  *******  324  *******
013160  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013162  000000                          HALT                    ;DESTINATION REG. NOT DECREMENTED BY 1
013164  021427  052400          MBDM4A: CMP     (R4),#52400     ;CHECK DEST. DATA
013170  001404                          BEQ     MBDM4B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                ;           WHICH FOLLOWS W/ 757           <
013172  012742  000325                  MOV     #325,-(R2)      ;MOVE TO MAILBOX #  *******  325  *******
013176  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013200  000000                          HALT                    ;DEST. DATA NOT CORRECT
013202  112740  125125          MBDM4B: MOVB    #125125,-(R0)   ;TRY MOVB DEST. MODE 4--EVEN BYTE
013206  102402                          BVS     MBDM4C          ;BR. TO ERROR IF V-BIT SET
013210  001401                          BEQ     MBDM4C          ;BR TO ERROR IF Z-BIT SET
013212  100004                          BPL     MBDM4D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=---=
                                                                ;           WHICH FOLLOWS W/ 746           <-
013214                          MBDM4C:
013214  012742  000326                  MOV     #326,-(R2)      ;MOVE TO MAILBOX #  *******  326  *******
013220  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013222  000000                          HALT                    ;COND. CODES INCORRECT
013224  005700                  MBDM4D: TST     R0              ;CHECK MODE 4 DEST. REGISTER
013226  001404                          BEQ     MBDM4E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 740           <
013230  012742  000327                  MOV     #327,-(R2)      ;MOVE TO MAILBOX #  *******  327  *******
013234  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013236  000000                          HALT                    ;DESTINATION REG NOT DECREMENTED BY 1
013240  021427  052525          MBDM4E: CMP     (R4),#52525     ;CHECK DEST. DAT^A
013244  001404                          BEQ     TS152
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <==
                                                                ;           CONDITIONAL BRANCH INST. AND   <-=-=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=--=
                                                                ;           WHICH FOLLOWS W/ 731           <--
013246  012742  000330                  MOV     #330,-(R2)      ;MOVE TO MAILBOX #  *******  330  *******
013252  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013254  000000                          HALT                    ;DESTINATION DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

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

```
                                        ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 5 AND THE MOVB
                                        ;DESTINATION MODE 5 - EVEN BYTE INSTRUCTIONS. R4 IS A
                                        ;POINTER TO TARGET LOCATION 0 AND R0 IS SETUP TO
                                        ;POINT TO LOCATION 376 FOR THE MOV, AND LOCATION 404 FOR
                                        ;THE MOVB INSTRUCTIONS. CMP INSTRUCTIONS ARE USED TO VERIFY
                                        ;PROPER ADDRESSING AND DATA.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 152       TEST MOV DESTINATION MODE 5
                                        ;*******************************************************************************
013256  005212                          TS152:  INC     (R2)            ;UPDATE TEST NUMBER
013260  022712  000152                          CMP     #152,(R2)       ;SEQUENCE ERROR?
013264  001051                                  BNE     TS153-10        ;BR TO ERROR HALT ON SEQ ERROR
013266  005004                                  CLR     R4              ;R4=0
013270  005014                                  CLR     (R4)            ;LOC. 0 = 0
013272  012700  000400                          MOV     #400,R0         ;R0=400
013276  012750  004321                          MOV     #4321,@-(R0)    ;TRY MOV DEST. MODE 5
013302  102402                                  BVS     MDM5A           ;BR TO ERROR IF V-BIT SET
013304  001401                                  BEQ     MDM5A           ;BR TO ERROR IF Z-BIT SET
013306  100004                                  BPL     MDM5B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <== =
                                                                        ;           CONDITIONAL BRANCH INST. AND   < =-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-==
                                                                        ;           WHICH FOLLOWS W/ 766           <-==-
013310                                  MDM5A:
013310  012742  000331                          MOV     #331,-(R2)      ;MOVE TO MAILBOX #  *******  331  *******
013314  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013316  000000                                  HALT                    ;COND. CODES INCORRECT
013320  022700  000376                  MDM5B:  CMP     #376,R0         ;CHECK MODE 5 REG. WAS DECREMENTED
013324  001404                                  BEQ     MDM5C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   < -
                                                                        ;           CONDITIONAL BRANCH INST. AND   <===-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <==
                                                                        ;           WHICH FOLLOWS W/ 757           <=-=
013326  012742  000332                          MOV     #332,-(R2)      ;MOVE TO MAILBOX #  *******  332  *******
013332  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013334  000000                                  HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
013336  022714  004321                  MDM5C:  CMP     #4321,(R4)      ;CHECK DEST. DATA
013342  001404                                  BEQ     MDM5D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---=
                                                                        ;           CONDITIONAL BRANCH INST. AND   <  =
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <= -=
                                                                        ;           WHICH FOLLOWS W/ 750           <=-==
013344  012742  000333                          MOV     #333,-(R2)      ;MOVE TO MAILBOX #  *******  333  *******
013350  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013352  000000                                  HALT                    ;DEST. DATA INCORRECT
013354  012700  000406                  MDM5D:  MOV     #406,R0         ;R0=406
013360  112750  000377                          MOVB    #377,@-(R0)     ;TRY MOV DEST. MODE 5 --EVEN BYTE
013364  022700  000404                          CMP     #404,R0         ;CHECK MODE 5 REG.
013370  001404                                  BEQ     MDM5E
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 735           <====
013372  012742  000334                          MOV     #334,-(R2)      ;MOVE TO MAILBOX #  *******  334  *******
013376  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
013400  000000                          HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
013402  022714  177721          MDM5E:  CMP     #177721,(R4)    ;CHECK DEST. DATA
013406  001404                          BEQ     TS153
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---==
                                                                ;           CONDITIONAL BRANCH INST. AND   <==-=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 726           <=--=
013410  012742  000335                  MOV     #335,-(R2)      ;MOVE TO MAILBOX #  *******  335  *******
013414  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013416  000000                          HALT                    ;DEST. DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 6 AND MOVB - EVEN BYTE
                                ;DESTINATION MODE 6 INDTRUCTIONS. R0 IS USED TO SETUP TARGET LOC.0
                                ;FOR BOTH TESTS. PATTERNS OF ONES AND ZEROES ARE MOVED INTO LOC.0
                                ;BY MODE 6 INSTRUCTIONS, AND CMP INSTRUCTIONS ARE USED TO VERIFY
                                ;PROPER ADDRESSING AND DATA.
                                ;
                                ;*******************************************************************************
                                ;TEST 153       TEST MOV DESTINATION MODE 6
                                ;*******************************************************************************
013420  005212                  TS153:  INC     (R2)            ;UPDATE TEST NUMBER
013422  022712  000153                  CMP     #153,(R2)       ;SEQUENCE ERROR?
013426  001054                          BNE     TS154-10        ;BR TO ERROR HALT ON SEQ ERROR
013430  005000                          CLR     R0              ;R0-0
013432  005010                          CLR     (R0)            ;LOC. 0=0
013434  005200                          INC     R0              ;R0=1
013436  012760  052525  177777          MOV     #052525,-1(R0)  ;TRY MOV DEST. MODE 6
013444  102402                          BVS     MDM6A           ;BR TO ERROR IF V-BIT SET
013446  001401                          BEQ     MDM6A           ;BR TO ERROR IF Z-BIT SET
013450  100004                          BPL     MDM6B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <  -
                                                                ;           WHICH FOLLOWS W/ 766           <
013452                          MDM6A:
013452  012742  000336                  MOV     #336,-(R2)      ;MOVE TO MAILBOX #  *******  336  *******
013456  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013460  000000                          HALT                    ;COND. CODES INCORRECT
013462  022700  000001          MDM6B:  CMP     #1,R0           ;CHECK DEST. REGISTER UNALTERED
013466  001404                          BEQ     MDM6C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   < -
                                                                ;           CONDITIONAL BRANCH INST. AND   <=-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-=-
                                                                ;           WHICH FOLLOWS W/ 757           <-=-
013470  012742  000337                  MOV     #337,-(R2)      ;MOVE TO MAILBOX #  *******  337  *******
013474  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013476  000000                          HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013500  022737  052525  000000  MDM6C:  CMP     #52525,@#0      ;CHECK DEST. DATA
013506  001404                          BEQ     MDM6D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   < - =
                                                                ;           WHICH FOLLOWS W/ 747           <
```

```
013510  012742  000340                  MOV     #340,-(R2)      ;MOVE TO MAILBOX #  *******  340  *******
013514  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013516  000000                          HALT                    ;DEST. DATA INCORRECT
013520  012700  000002          MDM6D:  MOV     #2,R0           ;R0=2
013524  112760  000377  177777          MOVB    #377,-1(R0)     ;TRY MOVB DEST. MODE 6
013532  022700  000002                  CMP     #2,R0           ;CHECK DEST. REGISTER UNALTERED
013536  001404                          BEQ     MDM6E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 733           <====
013540  012742  000341                  MOV     #341,-(R2)      ;MOVE TO MAILBOX #  *******  341  *******
013544  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013546  000000                          HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013550  022737  177525  000000  MDM6E:  CMP     #177525,@#0     ;CHECK DEST. DATA
013556  001404                          BEQ     TS154
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 723           <====
013560  012742  000342                  MOV     #342,-(R2)      ;MOVE TO MAILBOX #  *******  342  *******
013564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013566  000000                          HALT                    ;DEST. DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 7 AND MOVB - ODD BYTE
                                ;DESTINATION MODE 7 INSTRUCTIONS. R4 POINTS TO TARGET LOC.0 AND R0
                                ;IS USED AS THE MODE 7 ADDRESSING REGISTER. CMP INSTRUCTIONS ARE
                                ;USED TO VERIFY PROPER ADDRESSING AND DATA.
                                ;
                                ;*******************************************************************************
                                ;TEST 154       TEST MOV DESTINATION MODE 7
                                ;*******************************************************************************
013570  005212                  TS154:  INC     (R2)            ;UPDATE TEST NUMBER
013572  022712  000154                  CMP     #154,(R2)       ;SEQUENCE ERROR?
013576  001053                          BNE     TS155-10        ;BR TO ERROR HALT ON SEQ ERROR
013600  005004                          CLR     R4              ;R4=0
013602  005014                          CLR     (R4)            ;LOC.0=0
013604  012700  000403                  MOV     #403,R0         ;R0=403
013610  012770  070707  177777          MOV     #70707,@-1(R0)  ;TRY MOV W/DEST MODE 7
013616  102402                          BVS     MDM7A           ;BR. TO ERROR IF V-BIT SET
013620  001401                          BEQ     MDM7A           ;BR TO ERROR IF Z-BIT SET
013622  100004                          BPL     MDM7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 765           <====
013624                          MDM7A:
013624  012742  000343                  MOV     #343,-(R2)      ;MOVE TO MAILBOX #  *******  343  *******
013630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013632  000000                          HALT                    ;COND. CODES INCORRECT
013634  022700  000403          MDM7B:  CMP     #403,R0         ;CHECK DEST. REGISTER
013640  001404                          BEQ     MDM7C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
```

```
                                                                        ;            CONDITIONAL BRANCH INST. AND   <====
                                                                        ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;            WHICH FOLLOWS W/ 756           <====
013642  012742  000344                  MOV     #344,-(R2)              ;MOVE TO MAILBOX #  *******  344  *******
013646  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
013650  000000                          HALT                            ;DEST. REGISTER INCORRECTLY ALTERED
013652  022737  070707  000000  MDM7C:  CMP     #70707,@#0              ;CHECK DEST. DATA
013660  001404                          BEQ     MDM7D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;            CONDITIONAL BRANCH INST. AND   <====
                                                                        ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;            WHICH FOLLOWS w/ 746           <====
013662  012742  000345                  MOV     #345,-(R2)              ;MOVE TO MAILBOX #  *******  345  *******
013666  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
013670  000000                          HALT                            ;DEST. DATA INCORRECT
013672  112770  107070  000001  MDM7D:  MOVB    #107070,@1(R0)          ;TRY MOVB W/DEST MODE 7--ODD BYTE
013700  022700  000403                  CMP     #403,R0                 ;CHECK MODE 7 DEST. REG.
013704  001404                          BEQ     MDM7E
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;            CONDITIONAL BRANCH INST. AND   <====
                                                                        ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;            WHICH FOLLOWS W/ 734           <
013706  012742  000346                  MOV     #346,-(R2)              ;MOVE TO MAILBOX #  *******  346  *******
013712  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
013714  000000                          HALT                            ;DEST. DATA INCORRECT
013716  022737  034307  000000  MDM7E:  CMP     #34307,@#0              ;CHECK DEST. DATA
013724  001404                          BEQ     TS155
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;            CONDITIONAL BRANCH INST. AND   <
                                                                        ;            REPLACE  HE MOVE INSTRUCTION   <
                                                                        ;            WHICH FOLLOWS W/ 724           <
013726  012742  000347                  MOV     #347,-(R2)              ;MOVE TO MAILBOX #  *******  347  *******
013732  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
013734  000000                          HALT                            ;DESTINATION DATA INCORRECT
                                                                        ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 4 DOUBLE OPERAND INSTRUCTIONS.
                                ;THE TEST USES MODE 4 ADDRESSING WITH REGISTER 0 TO MOVE THRU A
                                ;TABLE OF OPERANDS.  THE TABLE OF OPERANDS AND THE WORK LOCATION IS
                                ;STORED FOLLOWING THE TEST CODE.  A SERIES OF 5 DOP INSTRUCTIONS UTILIZES
                                ;THE DATA IN THE TABLE TO CYCLE THE WORK LOCATION THRU A SET OF
                                ;VALUE.  THE DATA HAS BEEN CHOSEN TO INSURE THAT NO SINGLE ERROR WILL
                                ;GO UNDETECTED.  WORD AND BYTE INSTRUCTION ACCESSING BOTH EVEN AND
                                ;ODD ADDRESSES ARE USED IN THE TEST.  THE LISTING SHOWS THE
                                ;EXPECTED INTERMEDIATE RESULT AS EACH INSTRUCTION IS EXECUTED.
                                ;
                                ;*******************************************************************************
                                ;TEST 155       TEST MODE 4 W/ DOP INSTS.
                                ;*******************************************************************************
                                TS155:  INC     (R2)                    ;UPDATE TEST NUMBER
013736  005212                          CMP     #155,(R2)               ;SEQUENCE ERROR?
013740  022712  000155                  BNE     DOP4                    ;BR TO ERROR HALT ON SEQ ERROR
013744  001015                          MOV     #TBL1,R0                ;INITIALIZE R0
013746  012700  014020                  MOV     -(R0),@#TBL1            ;TBL1=125252
013752  014037  014020
```

```
013756  064037  014020                  ADD     -(R0),@#TBL1     ;TBL1=000377
013762  144037  014020                  BICB    -(R0),@#TBL1     ;TBL1=000252
013766  154037  014021                  BISB    -(R0),@#TBL1+1   ;TBL1=125252
013772  024037  014020                  CMP     -(R0),@#TBL1     ;CHECK RESULT
013776  001411                          BEQ     TS156
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=---
                                                                 ;           CONDITIONAL BRANCH INST. AND   <=
                                                                 ;           REPLACE THE MOVE INSTRUCTION   <--=
                                                                 ;           WHICH FOLLOWS W/ 762           <-=
014000                          DOP4:
014000  012742  000350                  MOV     #350,-(R2)       ;MOVE TO MAILBOX #  *******  350  *******
014004  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
014006  000000                          HALT                     ;RESULT OF MODE 4 INSTS. INCORRECT
                                                                 ;  OR SEQUENCE ERROR

014010  125252                          125252
014012  052652                          52652
014014  053125                          53125
014016  125252                          125252
014020  000000                  TBL1:   0

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 5 DOUBLE OPERAND INSTRUCTIONS.
                                ;THE TEST USES AN ADDRESS TABLE STORED FOLLOWING THE TEST CODE.
                                ;THIS TABLE IS SIMPLY A TABLE OF ADDRESS POINTERS WHICH ADDRESS
                                ;THE DATA TABLE USED IN THE PREVIOUS TEST.  THE TEST IS IDENTICAL TO
                                ;THE PREVIOUS TEST EXCEPT THE DATA IS REFERENCED USING THIS ADDRESS
                                ;TABLE AND MODE 5 ADDRESSING.  (SEE PREVIOUS TEST).
                                ;
                                ;*******************************************************************
                                ;TEST 156       TEST MODE 5 W/ DOP INSTS.
                                ;*******************************************************************
014022  005212                  TS156:  INC     (R2)             ;UPDATE TEST NUMBER
014024  022712  000156                  CMP     #156,(R2)        ;SEQUENCE ERROR?
014030  001015                          BNE     DOP5             ;BR TO ERROR HALT ON SEQ ERROR
014032  012700  014106                  MOV     #TBL2+2,R0       ;INITIALIZE R0
014036  015037  014020                  MOV     @-(R0),@#TBL1    ;TBL1=125252
014042  065037  014020                  ADD     @-(R0),@#TBL1    ;TBL1=000377
014046  145037  014020                  BICB    @-(R0),@#TBL1    ;TBL1=000252
014052  155037  014021                  BISB    @-(R0),@#TBL1+1  ;TBL1=125252
014056  025037  014020                  CMP     @-(R0),@#TBL1    ;CHECK RESULT
014062  001411                          BEQ     TS157
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                 ;           CONDITIONAL BRANCH INST. AND   <
                                                                 ;           REPLACE THE MOVE INSTRUCTION   <
                                                                 ;           WHICH FOLLOWS W/ 762           <
014064                          DOP5:
014064  012742  000351                  MOV     #351,-(R2)       ;MOVE TO MAILBOX #  *******  351  *******
014070  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
014072  000000                          HALT                     ;RESULT OF MODE 5 INSTS. INCORRECT
                                                                 ;  OR SEQUENCE ERROR

014074  014010                          TBL1-10
014076  014012                          TBL1-6
014100  014013                          TBL1-5
014102  014014                          TBL1-4
```

4840 014104 014016 TBL2: TBL1-2

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 6 DOUBLE OPERAND INSTRUCTIONS.
                                        ;IT USES THE SAME DATA AS THAT USED IN THE MODE 4 TESTS.
                                        ;THIS TIME THE DATA IS ACCESSED USING MODE 6.  R0 IS SET
                                        ;TO POINT TO THE MIDDLE OF THE TABLE.  THE TABLE IS ACCESSED FROM
                                        ;BOTTOM TO TOP BY VARYING THE OFFSET IN THE MODE 6 INSTRUCTIONS.
                                        ;THE DATA RESULTS ARE IDENTICAL TO THOSE EXPECTED IN THE MODE 4
                                        ;TESTS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 157       TEST MODE 6 W/ DOP INSTS.
                                        ;*******************************************************************************
014106  005212                          TS157:  INC     (R2)            ;UPDATE TEST NUMBER
014110  022712  000157                          CMP     #157,(R2)       ;SEQUENCE ERROR?
014114  001022                                  BNE     TS160-10        ;BR TO ERROR HALT ON SEQ ERROR
014116  012700  014014                          MOV     #TBL1-4,R0      ;INITIALIZE R0
014122  016037  000002  014020                  MOV     2(R0),@#TBL1    ;TBL1=125252
014130  066037  000000  014020                  ADD     0(R0),@#TBL1    ;TBL1=000377
014136  146037  177777  014020                  BICB    -1(R0),@#TBL1   ;TBL1=000252
014144  156037  177776  014021                  BISB    -2(R0),@#TBL1+1 ;TBL1=125252
014152  026037  177774  014020                  CMP     -4(R0),@#TBL1   ;CHECK RESULT
014160  001404                                  BEQ     TS160
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 755           <
014162  012742  000352                          MOV     #352,-(R2)      ;MOVE TO MAILBOX #  *******  352  *******
014166  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014170  000000                                  HALT                    ;RESULT OF MODE 6 INSTS. INCORRECT
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 7 DOUBLE OPERAND INSTRUCTIONS.
                                        ;THIS TEST USES THE SAME ADDRESS TABLE AND DATA TABLE USED BY
                                        ;THE MODE 5 TESTS.  THIS TIME THE DATA IS ACCESSED USING MODE 7.
                                        ;R0 IS SET TO POINT TO THE MIDDLE OF THE ADDRESS TABLE IN THE MODE 5
                                        ;TEST.  THE TABLE IS ACCESSED FROM BOTTOM TO TOP BY VARYING THE OFFSET
                                        ;IN THE MODE 7 INSTRUCTIONS.  THE DATA RESULTS ARE IDENTICAL TO
                                        ;THOSE EXPECTED IN THE MODE 5 TESTS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 160       TEST MODE 7 W/ DOP INSTS.
                                        ;*******************************************************************************
014172  005212                          TS160:  INC     (R2)            ;UPDATE TEST NUMBER
014174  022712  000160                          CMP     #160,(R2)       ;SEQUENCE ERROR?
014200  001022                                  BNE     TS161-10        ;BR TO ERROR HALT ON SEQ ERROR
014202  012700  014100                          MOV     #TBL2-4,R0      ;INITIALIZE R0
014206  017037  000004  014020                  MOV     @4(R0),@#TBL1   ;TBL1=125252
014214  067037  000002  014020                  ADD     @2(R0),@#TBL1   ;TBL1=000377
014222  147037  000000  014020                  BICB    @0(R0),@#TBL1   ;TBL1=000252
014230  157037  177776  014021                  BISB    @-2(R0),@#TBL1+1                ;TBL1=125252
014236  027037  177774  014020                  CMP     @-4(R0),@#TBL1          ;CHECK RESULT
014244  001404                                  BEQ     TS161
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
```

```
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 755           <-
014246  012742  000353                  MOV     #353,-(R2)      ;MOVE TO MAILBOX #  *******  353  *******
014252  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014254  000000                          HALT                    ;RESULT OF MODE 7 INSTS INCORRECT
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE ROTATE MODE 0 INSTRUCTIONS.
                                ;R0 IS LOADED WITH A DATA PATTERN, THE C-BIT IS LOADED, AND
                                ;AN ROL INSTRUCTION IS EXECUTED WITH MODE 0.  THE OPERATION IS CHECKED
                                ;BY TESTING THE RESULTING DATA AND THE STATE OF THE C AND V BITS.
                                ;NEXT, THE SAME PROCEDURE IS EXECUTED TO TEST MODE 0 BYTE INSTRUCTIONS.
                                ;
                                ;*******************************************************************
                                ;TEST 161       TEST ROTATE INSTRUCTIONS OF MODE 0
                                ;*******************************************************************
014256  005212                  TS161:  INC     (R2)            ;UPDATE TEST NUMBER
014260  022712  000161                  CMP     #161,(R2)       ;SEQUENCE ERROR?
014264  001026                          BNE     TS162-10        ;BR TO ERROR HALT ON SEQ ERROR
014266  012700  125252                  MOV     #125252,R0      ;INITIALIZE DATA
014272  000261                          SEC                     ;SET C-BIT
014274  006100                          ROL     R0              ;TRY ROL W/ MODE 0
014276  102004                          BVC     ROTOA           ;CC=0011
014300  103003                          BCC     ROTOA
014302  022700  052525                  CMP     #052525,R0      ;CHECK DATA
014306  001404                          BEQ     ROTOB
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 766           <-
014310                          ROTOA:
014310  012742  000354                  MOV     #354,-(R2)      ;MOVE TO MAILBOX #  *******  354  *******
014314  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014316  000000                          HALT                    ;ROL MODE 0 FAILED
014320  012700  125252          ROTOB:  MOV     #125252,R0      ;INITIALIZE DATA
014324  000261                          SEC                     ;SET C-BIT
014326  106100                          ROLB    R0              ;TRY ROL W/ MODE 0 EVEN BYTE
014330  102004                          BVC     ROTOC           ;CC=0011
014332  103003                          BCC     ROTOC
014334  022700  125125                  CMP     #125125,R0      ;CHECK DATA
014340  001404                          BEQ     TS162
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 751           <-
014342                          ROTOC:
014342  012742  000355                  MOV     #355,-(R2)      ;MOVE TO MAILBOX #  *******  355  *******
014346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014350  000000                          HALT                    ;ROLB MODE 0 FAILED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE ROTATE MODE 1 INSTRUCTIONS.
                                        ;THE DATA TO BE ROTATED IS IN LOC 0.  R0 IS USED AS THE
                                        ;ADDRESSING REGISTER.  THE C-BIT IS LOADED AND AN ROL IS EXECUTED.
                                        ;THE RESULTS ARE CHECKED BY COMPARING THE DATA RESULTS AND TESTING
                                        ;THE C AND V BITS.  THIS PROCEDURE IS THEN REPEATED TWICE MORE
                                        ;TO TEST THE BYTE ROTATES.  FIRST ON BYTE 0, THEN ON BYTE 1.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 162       TEST ROTATE INSTRUCTIONS W/ MODE 1
                                        ;*******************************************************************
014352  005212                          TS162:  INC     (R2)            ;UPDATE TEST NUMBER
014354  022712  000162                          CMP     #162,(R2)       ;SEQUENCE ERROR?
014360  001051                                  BNE     TS163-10        ;BR TO ERROR HALT ON SEQ ERROR
014362  005000                                  CLR     R0              ;POINT TO LOC. 0
014364  012710  052525                          MOV     #52525,(R0)     ;INITIALIZE DATA
014370  000241                                  CLC                     ;CLEAR C-BIT
014372  006110                                  ROL     (R0)            ;TRY ROL W/ MODE 1
014374  102005                                  BVC     ROT1A           ;CC=1010
014376  103404                                  BCS     ROT1A
014400  023727  000000  125252                  CMP     @#0,#125252     ;CHECK RESULT
014406  001404                                  BEQ     ROT1B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 764           <
014410                                  ROT1A:
014410  012742  000356                          MOV     #356,-(R2)      ;MOVE TO MAILBOX #  *******  356  *******
014414  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014416  000000                                  HALT                    ;ROL MODE 1 FAILED
014420  000261                          ROT1B:  SEC
014422  012710  125252                          MOV     #125252,(R0)    ;INITIALIZE DATA
014426  106110                                  ROLB    (R0)            ;TRY ROLB W/ MODE 1 EVEN BYTE
014430  102005                                  BVC     ROT1C           ;CC=1011
014432  103004                                  BCC     ROT1C
014434  022737  125125  000000                  CMP     #125125,@#0     ;TEST RESULT
014442  001404                                  BEQ     ROT1D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-  ==
                                                                        ;           CONDITIONAL BRANCH INST. AND   <   -=
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <=-==
                                                                        ;           WHICH FOLLOWS W/ 746           <=-  =
014444                                  ROT1C:
014444  012742  000357                          MOV     #357,-(R2)      ;MOVE TO MAILBOX #  *******  357  *******
014450  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014452  000000                                  HALT                    ;ROLB W/ MODE 1 EVEN BYTE FAILED
014454  012710  125252                  ROT1D:  MOV     #125252,(R0)
014460  005000                                  CLR     R0              ;POINT TO ODD BYTE
014462  005200                                  INC     R0
014464  000261                                  SEC                     ;SET C-BIT
014466  106110                                  ROLB    (R0)            ;TRY ROLB W/ MODE 1 ODD BYTE
014470  102005                                  BVC     ROT1E           ;CC=0011
014472  103004                                  BCC     ROT1E
014474  022737  052652  000000                  CMP     #052652,@#0     ;CHECK DATA
014502  001404                                  BEQ     TS163
```

```
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 726           <====
014504                          ROT1E:
014504  012742  000360                  MOV     #360,-(R2)      ;MOVE TO MAILBOX #  *******  360  *******
014510  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014512  000000                          HALT                    ;ROLB W/ MODE 1 ODD BYTE FAILED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 2 ROTATE INSTRUCTIONS.
                                ;THE SAME PROCEDURE AS IN THE OTHER ROTATE TESTS ARE USED.  R0
                                ;IS USED AS THE ADDRESSING REGISTER AND IS CHECKED FOR PROPER
                                ;INCREMENTING.  BYTE INSTRUCTIONS ARE ALSO CHECKED.
                                ;
                                ;*******************************************************************
                                ;TEST 163       TEST ROTATE INSTRUCTIONS W/ MODE 2
                                ;*******************************************************************
014514  005212                  TS163:  INC     (R2)            ;UPDATE TEST NUMBER
014516  022712  000163                  CMP     #163,(R2)       ;SEQUENCE ERROR?
014522  001057                          BNE     TS164-10        ;BR TO ERROR HALT ON SEQ ERROR
014524  005000                          CLR     R0              ;POINT TO LOC 0
014526  012710  173737                  MOV     #173737,(R0)    ;INITIALIZE DATA
014532  000241                          CLC                     ;CLEAR C-BIT
014534  006120                          ROL     (R0)+           ;TRY ROL W/ MODE 2
014536  103007                          BCC     ROT2A           ;CHECK C-BIT
014540  022737  167676  000000          CMP     #167676,@#0     ;CHECK DATA
014546  001003                          BNE     ROT2A           ;BRANCH IF RESULT INCORRECT
014550  005300                          DEC     R0              ;TEST R0
014552  005300                          DEC     R0
014554  001404                          BEQ     ROT2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 762           <
014556                          ROT2A:
014556  012742  000361                  MOV     #361,-(R2)      ;MOVE TO MAILBOX #  *******  361  *******
014562  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014564  000000                          HALT                    ;ROL W/ MODE 2 FAILED
014566  005000                  ROT2B:  CLR     R0              ;POINT TO LOC 0
014570  012710  004040                  MOV     #4040,(R0)      ;INITIALIZE DATA
014574  000241                          CLC                     ;CLEAR C-BIT
014576  106120                          ROLB    (R0)+           ;TRY ROLB W/ MODE 2 EVEN BYTE
014600  103406                          BCS     ROT2C           ;CHECK C-BIT
014602  022737  004100  000000          CMP     #4100,@#0       ;CHECK DATA
014610  001002                          BNE     ROT2C           ;BRANCH IF DATA INCORRECT
014612  005300                          DEC     R0              ;CHECK R0
014614  001404                          BEQ     ROT2D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 742           <
014616                          ROT2C:
014616  012742  000362                  MOV     #362,-(R2)      ;MOVE TO MAILBOX #  *******  362  *******
```

```
014622  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014624  000000                          HALT                    ;ROLB W/ MODE 2 EVEN BYTE FAILED
014626  005000                  ROT2D:  CLR     R0              ;POINT TO LOC 0
014630  012710  004040                  MOV     #4040,(R0)      ;INITIALIZE DATA
014634  005200                          INC     R0              ;POINT TO ODD BYTE OF DATA
014636  000261                          SEC                     ;SET C-BIT
014640  106120                          ROLB    (R0)+           ;TRY ROL W/ MODE 2 ODD BYTE
014642  103407                          BCS     ROT2E           ;CHECK C-BIT
014644  022737  010440  000000          CMP     #10440,@#0      ;CHECK DATA
014652  001003                          BNE     ROT2E           ;BRANCH IF DATA INCORRECT
014654  005300                          DEC     R0              ;CHECK R0
014656  005300                          DEC     R0
014660  001404                          BEQ     TS164
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-=
                                                                ;           CONDITIONAL BRANCH INST. AND    <-=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=---
                                                                ;           WHICH FOLLOWS W/ 720            <---
014662                          ROT2E:
014662  012742  000363                  MOV     #363,-(R2)      ;MOVE TO MAILBOX #  *******  363  *******
014666  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014670  000000                          HALT                    ;ROLB W/ MODE 2 ODD BYTE FAILED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 3 ROTATE INSTRUCTIONS.
                                        ;THIS TEST USES THE SAME PROCEDURES AS IN THE OTHER ROTATE
                                        ;TESTS.  THE DATA IS STORED IN LOC. 0 AND IS ADDRESSED USING
                                        ;MODE 37.  BYTE ADDRESSING IS ALSO CHECKED FOR EVEN AND ODD BYTES.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 164       TEST ROTATE INSTRUCTIONS /W MODE 3
                                        ;*******************************************************************************
014672  005212                          TS164:  INC     (R2)            ;UPDATE TEST NUMBER
014674  022712  000164                          CMP     #164,(R2)       ;SEQUENCE ERROR?
014700  001051                                  BNE     TS165-10        ;BR TO ERROR HALT ON SEQ ERROR
014702  012737  052525  000000                  MOV     #52525,@#0      ;INITIALIZE DATA IN LOC 0
014710  000261                                  SEC                     ;SET C-BIT
014712  006137  000000                          ROL     @#0             ;TRO ROL W/ MODE 3
014716  103404                                  BCS     ROT3A           ;CHECK C-BIT
014720  022737  125253  000000                  CMP     #125253,@#0     ;CHECK DATA
014726  001404                                  BEQ     ROT3B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <----
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
014730                                  ROT3A:
014730  012742  000364                          MOV     #364,-(R2)      ;MOVE TO MAILBOX #  *******  364  *******
014734  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014736  000000                                  HALT                    ;ROL W/ MODE 3 FAILED
014740  012737  125252  000000          ROT3B:  MOV     #125252,@#0     ;INITIALIZE DATA
014746  000241                                  CLC                     ;CLEAR C-BIT
014750  106137  000000                          ROLB    @#0             ;TRY ROL W/ MODE 3 EVEN BYTE
014754  103004                                  BCC     ROT3C           ;CHECK C-BIT
014756  023727  000000  125124  4$:             CMP     @#0,#125124     ;CHECK DATA
014764  001404                                  BEQ     ROT3D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 745            <====
014766                                  ROT3C:
014766  012742  000365                          MOV     #365,-(R2)      ;MOVE TO MAILBOX #  *******  365  *******
014772  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014774  000000                                  HALT                    ;ROL W/ MODE 3 EVEN BYTE FAILED
014776  012737  125252  000000          ROT3D:  MOV     #125252,@#0     ;INITIALIZE DATA IN LOC. 0
015004  000261                                  SEC                     ;SET C-BIT
015006  106137  000001                          ROLB    @#1             ;TRY ROL W/ MODE 3 ODD BYTE
015012  103004                                  BCC     ROT3E           ;CHECK C-BIT
015014  022737  052652  000000                  CMP     #052652,@#0     ;CHECK DATA
015022  001404                                  BEQ     TS165
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <----
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <----
                                                                        ;           WHICH FOLLOWS W/ 726            <====
015024                                  ROT3E:
015024  012742  000366                          MOV     #366,-(R2)      ;MOVE TO MAILBOX #  *******  366  *******
015030  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015032  000000                                  HALT                    ;ROL W/ MODE 3 ODD BYTE FAILED
```

```
                                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 4 ROTATE INSTRUCTIONS.  THE DATA IS
                                ;STORED IN LOC. 0.  R0 IS SET TO 2 AND THE CARRY IS SET.  AN ROL MODE 4
                                ;IS USED TO ROTATE LOCATION 0 USING R0.  THE DATA IS CHECKED
                                ;AND THE C AND V BITS ARE TESTED.  THE PROPER DECREMENTING OF
                                ;R0 IS VERIFIED.
                                ;
                                ;*******************************************************************
                                ;TEST 165       TEST MODE 4 W/ ROTATE INSTRUCTIONS
                                ;*******************************************************************
015034  005212                  TS165:  INC     (R2)            ;UPDATE TEST NUMBER
015036  022712  000165                  CMP     #165,(R2)       ;SEQUENCE ERROR?
015042  001016                          BNE     TS166-10        ;BR TO ERROR HALT ON SEQ ERROR
015044  012737  070707  000000          MOV     #070707,@#0     ;INITIALIZE DATA IN LOC. 0
015052  012700  000002                  MOV     #2,R0           ;INITIALIZE R0 AS POINTER
015056  000261                          SEC                     ;SET C-BIT
015060  006140                          ROL     -(R0)           ;TRY ROL W/ MODE 4
015062  103406                          BCS     ROT4            ;CHECK C-BIT
015064  022737  161617  000000          CMP     #161617,@#0     ;CHECK DATA
015072  001002                          BNE     ROT4            ;BRANCH IF DATA INCORRECT
015074  005700                          TST     R0              ;CHECK MODE 4 REGISTER
015076  001404                          BEQ     TS166
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 761           <--
015100                          ROT4:
015100  012742  000367                  MOV     #367,-(R2)      ;MOVE TO MAILBOX #  *******  367  *******
015104  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015106  000000                          HALT                    ;ROL MODE 4 FAILED
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 5 ROTATE INSTRUCTIONS.
                                ;THE DATA IS STORED IN A WORK LOCATION (ROTX) AT THE END OF THE
                                ;TEST CODE.  LOC. 0 IS LOADED WITH THE ADDRESS OF THE DATA (ROTX).
                                ;R0 IS SET TO 2.  THE CARRY IS CLEARED AND A MODE 5 ROL
                                ;IS EXECUTED USING R0 AS AN ADDRESSING REGISTER.  THE DATA IS
                                ;CHECKED, THE C AND V BITS TESTED, AND R0 CHECKED FOR PROPER
                                ;DECREMENTING.
                                ;
                                ;*******************************************************************
                                ;TEST 166       TEST MODE 5 W/ ROTATE INSTRUCTIONS
                                ;*******************************************************************
015110  005212                  TS166:  INC     (R2)            ;UPDATE TEST NUMBER
015112  022712  000166                  CMP     #166,(R2)       ;SEQUENCE ERROR?
015116  001021                          BNE     ROT5            ;BR TO ERROR HALT ON SEQ ERROR
015120  012737  015172  000000          MOV     #ROTX,@#0       ;MOVE POINTER TO LOC. 0
015126  012700  000002                  MOV     #2,R0           ;SET MODE 5 REG. TO LOC. 0
015132  012767  107070  000032          MOV     #107070,ROTX    ;INITIALIZE DATA
015140  000241                          CLC                     ;CLEAR C-BIT
015142  006150                          ROL     @-(R0)          ;TRY ROL W/ MODE 5
```

```
015144  103006                          BCC     ROT5            ;CHECK C-BIT
015146  022737  016160  015172          CMP     #016160,@#ROTX  ;CHECK DATA
015154  001002                          BNE     ROT5            ;BRANCH IF DATA INCORRECT
015156  005700                          TST     R0              ;CHECK MODE 5 REGISTER
015160  001405                          BEQ     TS167
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 756           <=
015162                          ROT5:
015162  012742  000370                  MOV     #370,-(R2)      ;MOVE TO MAILBOX #  *******  370  *******
015166  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015170  000000                          HALT                    ;ROL MODE 5 FAILED
                                                                ;  OR SEQUENCE ERROR
015172  000000                  ROTX:   0

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 6 ROTATE INSTRUCTIONS.
                                ;IT USES THE SAME PROCEDURE AS THE ABOVE TEST EXCEPT THE
                                ;ROTATE INSTRUCTION USES MODE 6 ADDRESSING WITH REGISTER 7.
                                ;THE DATA IS STILL OPERATED ON IN LOC. ROTX (SEE PREVIOUS TEST).
                                ;
                                ;*******************************************************************************
                                ;TEST 167       TEST MODE 6 W/ ROTATE INSTRUCTIONS
                                ;*******************************************************************************
015174  005212                  TS167:  INC     (R2)            ;UPDATE TEST NUMBER
015176  022712  000167                  CMP     #167,(R2)       ;SEQUENCE ERROR?
015202  001013                          BNE     TS170-10        ;BR TO ERROR HALT ON SEQ ERROR
015204  012737  125252  015172          MOV     #125252,@#ROTX  ;INITIALIZE DATA
015212  000261                          SEC                     ;SET C-BIT
015214  006167  177752                  ROL     ROTX            ;TRY ROL W/ MODE 6
015220  103004                          BCC     ROT6            ;CHECK C-BIT
015222  022737  052525  015172          CMP     #52525,@#ROTX   ;CHECK DATA
015230  001404                          BEQ     TS170
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 764           <
015232                          ROT6:
015232  012742  000371                  MOV     #371,-(R2)      ;MOVE TO MAILBOX #  *******  371  *******
015236  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015240  000000                          HALT                    ;ROL W/ MODE 6 FAILED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;THIS TEST VERIFIES MODE 7 ROTATE INSTRUCTIONS.
                                        ;THE DATA IS SET IN LOC. ROTX, (SEE PREVIOUS TEST).  THE ROL INSTRUCTION
                                        ;ADDRESSES IT INDIRECTLY USING MODE 7 AND INDIRECT ADDRESS LOCATION
                                        ;(ROTXAD) FOLLOWING THE TEST CODE.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 170       TEST MODE 7 W/ ROTATE INSTRUCTIONS
                                        ;*******************************************************************************
015242  005212                          TS170:  INC     (R2)            ;UPDATE TEST NUMBER
015244  022712  000170                          CMP     #170,(R2)       ;SEQUENCE ERROR?
015250  001016                                  BNE     ROT7            ;BR TO ERROR HALT ON SEQ ERROR
015252  012737  052525  015172                  MOV     #52525,@#ROTX   ;INITIALIZE DATA
015260  012737  015172  015316                  MOV     #ROTX,@#ROTXAD  ;INITIALIZE ADDRESS POINTER
015266  000241                                  CLC                     ;CLEAR C-BIT
015270  006177  000022                          ROL     @ROTXAD         ;TRY ROL W/ MODE 7
015274  103404                                  BCS     ROT7            ;CHECK C-BIT
015276  023727  015172  125252                  CMP     @#ROTX,#125252  ;CHECK DATA
015304  001405                                  BEQ     TS171
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 761            <====
015306                                  ROT7:
015306  012742  000372                          MOV     #372,-(R2)      ;MOVE TO MAILBOX #  *******  372  *******
015312  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015314  000000                                  HALT                    ;ROL W/ MODE 7 FAILED
                                                                        ;  OR SEQUENCE ERROR
015316  000000                          ROTXAD: 0


                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 0 SWAB INSTRUCTION.  R0 IS SET TO
                                        ;177400.  A SWAB MODE 0 IS EXECUTED AND THE CONDITIONAL BRANCH
                                        ;IS USED TO CHECK THE SIGN OF THE RESULT.  ALSO, A COMPARISON
                                        ;IS MADE TO CHECK THE DATA RESULTS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 171       TEST MODE 0 W/ SWAB INST.
                                        ;*******************************************************************************
015320  005212                          TS171:  INC     (R2)            ;UPDATE TEST NUMBER
015322  022712  000171                          CMP     #171,(R2)       ;SEQUENCE ERROR?
015326  001013                                  BNE     TS172-10        ;BR TO ERROR HALT ON SEQ ERROR
015330  012700  177400                          MOV     #177400,R0      ;MOVE TEST PATTERN TO R0
015334  000300                                  SWAB    R0              ;TRY SWAB MODE 0
015336  100404                                  BMI     SB0
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 773            <====
015340  012742  000373                          MOV     #373,-(R2)      ;MOVE TO MAILBOX #  *******  373  *******
015344  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015346  000000                                  HALT                    ;SWAB DID NOT SET CC'S CORRECT
```

```
015350  022700  000377          SB0:    CMP     #377,R0         ;CHECK RESULT
015354  001404                          BEQ     TS172
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <==-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                ;           WHICH FOLLOWS W/ 764           <---
015356  012742  000374                  MOV     #374,-(R2)      ;MOVE TO MAILBOX #  *******  374  *******
015362  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015364  000000                          HALT                    ;RESULT OF SWAB MODE 0 FAILED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 1 SWAB INSTRUCTION.  THE TEST
                                ;PATTERN IS MOVED TO LOC 0.  R0 IS CLEARED AND USED AS THE ADDRESSING
                                ;REGISTER IN THE MODE 1 SWAB.  THE DATA RESULTS ARE CHECKED WITH
                                ;A COMPARE.
                                ;
                                ;*******************************************************************************
                                ;TEST 172       TEST MODE 1 W/ SWAB INST
                                ;*******************************************************************************
015366  005212                  TS172:  INC     (R2)            ;UPDATE TEST NUMBER
015370  022712  000172                  CMP     #172,(R2)       ;SEQUENCE ERROR?
015374  001011                          BNE     TS173-10        ;BR TO ERROR HALT ON SEQ ERROR
015376  012737  125652  000000          MOV     #125652,@#0     ;MOVE TEST PATTERN TO LOC. 0
015404  005000                          CLR     R0              ;R0=0
015406  000310                          SWAB    (R0)            ;TRY SWAB MODE 1
015410  022737  125253  000000          CMP     #125253,@#0     ;CHECK RESULT
015416  001404                          BEQ     TS173
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <
015420  012742  000375                  MOV     #375,-(R2)      ;MOVE TO MAILBOX #  *******  375  *******
015424  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015426  000000                          HALT                    ;RESULT OF SWAB MODE 1 FAILED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 2 SWAB INSTRUCTION.  THE TEST
                                        ;PATTERN IS MOVED TO LOC 0.  R0 IS CLEARED AND USED AS THE MODE
                                        ;2 ADDRESSING REGISTER.  THE RESULTS ARE CHECKED WITH A COMPARE.
                                        ;R0 IS CHECKED FOR PROPER DECREMENTING.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 173       TEST MODE 2 W/ SWAB INST
                                        ;*******************************************************************************
015430  005212                          TS173:  INC     (R2)            ;UPDATE TEST NUMBER
015432  022712  000173                          CMP     #173,(R2)       ;SEQUENCE ERROR?
015436  001020                                  BNE     TS174-10        ;BR TO ERROR HALT ON SEQ ERROR
015440  012737  125152  000000                  MOV     #125152,@#0     ;MOVE TEST PATTERN TO LOC. 0
015446  005000                                  CLR     R0              ;R0=0
015450  000320                                  SWAB    (R0)+           ;TRY SWAB MODE 2
015452  022737  065252  000000                  CMP     #65252,@#0      ;CHECK RESULT
015460  001404                                  BEQ     SB2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-= -
                                                                        ;           CONDITIONAL BRANCH INST. AND    <== =
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-=--
                                                                        ;           WHICH FOLLOWS W/ 766            <-=--
015462  012742  000376                          MOV     #376,-(R2)      ;MOVE TO MAILBOX #  *******  376  *******
015466  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015470  000000                                  HALT                    ;RESULT OF SWAB MODE 0 FAILED
015472  162700  000002                  SB2:    SUB     #2,R0           ;CHECK EFFECT OF REG.
015476  001404                                  BEQ     TS174
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-_==
                                                                        ;           CONDITIONAL BRANCH INST. AND    <- -
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-_-=
                                                                        ;           WHICH FOLLOWS W/ 757            <-_
015500  012742  000377                          MOV     #377,-(R2)      ;MOVE TO MAILBOX #  *******  377  *******
015504  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015506  000000                                  HALT                    ;REGISTER VALUE INCORRECT
                                                                        ;  OR SEQUENCE ERROR


                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 3 SWAB INSTRUCTION.  THE TEST
                                        ;PATTERN IS MOVED TO LOC 0.  A MODE 3 SWAB INSTRUCTION IS EXECUTED
                                        ;USING R7 AS THE ADDRESSING REGISTER.  A COMPARE VERIFIES THE
                                        ;DATA RESULTS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 174       TEST MODE 3 W/SWAB INST.
                                        ;*******************************************************************************
015510  005212                          TS174:  INC     (R2)            ;UPDATE TEST NUMBER
015512  022712  000174                          CMP     #174,(R2)       ;SEQUENCE ERROR?
015516  001011                                  BNE     TS175-10        ;BR TO ERROR HALT ON SEQ ERROR
015520  012737  000377  000000                  MOV     #377,@#0        ;MOVE TEST PATTERN TO LOC. 0
015526  000337  000000                          SWAB    @#0             ;TRY SWAB W/ MODE 3
015532  022737  177400  000000                  CMP     #177400,@#0     ;CHECK RESULT
015540  001404                                  BEQ     TS175
```

```
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                  ;           CONDITIONAL BRANCH INST. AND   <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                  ;           WHICH FOLLOWS W/ 766           <====
015542  012742  000400                  MOV     #400,-(R2)        ;MOVE TO MAILBOX #  *******  400  *******
015546  005242                          INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
015550  000000                          HALT                      ;RESULT OF SWAB INCORRECT
                                                                  ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 4 SWAB INSTRUCTIONS.  THE DATA
                                        ;IS MOVED TO LOC 0.  R0 IS SET TO 2 AND USED AS THE MODE 4 ADDRESSING
                                        ;REGISTER.  THE DATA IS CHECKED WITH A COMPARE AND R0 IS CHECKED
                                        ;FOR PROPER DECREMENTING.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 175       TEST MODE 4 W/ SWAB INST
                                        ;*******************************************************************************
015552  005212                          TS175:  INC     (R2)            ;UPDATE TEST NUMBER
015554  022712  000175                          CMP     #175,(R2)       ;SEQUENCE ERROR?
015560  001020                                  BNE     TS176-10        ;BR TO ERROR HALT ON SEQ ERROR
015562  012737  125652  000000                  MOV     #125652,@#0     ;MOVE TEST PATTERN TO LOC. 0
015570  012700  000002                          MOV     #2,R0           ;SET UP REGISTER POINTER
015574  000340                                  SWAB    -(R0)           ;TRY SWAB MODE 4
015576  022737  125253  000000                  CMP     #125253,@#0     ;CHECK RESULT
015604  001404                                  BEQ     SB4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 765            <
015606  012742  000401                          MOV     #401,-(R2)      ;MOVE TO MAILBOX #  *******  401  *******
015612  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015614  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
015616  005700                          SB4:    TST     R0              ;CHECK EFFECT ON REG.
015620  001404                                  BEQ     TS176
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 757            <
015622  012742  000402                          MOV     #402,-(R2)      ;MOVE TO MAILBOX #  *******  402  *******
015626  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015630  000000                                  HALT                    ;REGISTER VALUE INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 5 SWAB INSTRUCTION.  THE TEST USES
                                        ;TWO LOCATIONS FOLLOWING THE TEST CODE.  SB5X HOLDS THE DATA;
                                        ;SB5XAD IS A POINTER TO THE DATA LOCATION.  THE DATA IS MOVED TO
                                        ;SB5X AND R0 IS SET TO TWO PLUS THE ADDRESS OF SB5XAD.  FOLLOWING
                                        ;THE MODE 5 SWAB SB5X IS CHECKED FOR THE PROPER DATA.  R0 IS
                                        ;CHECKED TO SEE THAT IT WAS DECREMENTED PROPERLY.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 176       TEST MODE 5 W/ SWAB INST.
                                        ;*******************************************************************************
015632  005212                          TS176:  INC     (R2)            ;UPDATE TEST NUMBER
015634  022712  000176                          CMP     #176,(R2)       ;SEQUENCE ERROR?
015640  001021                                  BNE     SB5             ;BR TO ERROR HALT ON SEQ ERROR
015642  012700  015720                          MOV     #SB5XAD+2,R0    ;SET UP POINTER TO WORK LOCATION
015646  012767  125125  000040                  MOV     #125125,SB5X    ;MOVE PATTERN TO WORK LOCATION
015654  000350                                  SWAB    @-(R0)          ;TRY SWAB MODE 5
015656  022767  052652  000030                  CMP     #52652,SB5X     ;CHECK RESULT
015664  001404                                  BEQ     SB5A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THI     <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 765            <
015666  012742  000403                          MOV     #403,-(R2)      ;MOVE TO MAILBOX #  *******  403  *******
015672  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015674  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
015676  020027  015716                  SB5A:   CMP     R0,#SB5XAD      ;CHECK RESULT OF REG.
015702  001406                                  BEQ     TS177
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 756            <
015704                                  SB5:
015704  012742  000404                          MOV     #404,-(R2)      ;MOVE TO MAILBOX #  *******  404  *******
015710  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015712  000000                                  HALT                    ;REGISTER VALUE INCORRECT
                                                                        ;  OR SEQUENCE ERROR
015714  000000                          SB5X:   0                       ;WORK LOCATION
015716  015714                          SB5XAD: SB5X
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 6 SWAB INSTRUCTION.  THIS TEST
                                        ;USES A WORK LOCATION (SB6X) FOLLOWING THE TEST CODE.  TEST DATA
                                        ;IS LOADED INTO THE WORK LOCATION.  R0, THE ADDRESSING REGISTER
                                        ;IS LOADED WITH 6 LESS THEN THE ADDRESS OF THE WORK LOCATION.
                                        ;THE MODE 6 SWAB IS EXECUTED WITH A +6 OFFSET.  THE DATA IS
                                        ;VERIFIED WITH A COMPARE.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 177       TEST MODE 6 W/ SWAB INST.
                                        ;*******************************************************************************
015720  005212                          TS177:  INC     (R2)            ;UPDATE TEST NUMBER
015722  022712  000177                          CMP     #177,(R2)       ;SEQUENCE ERROR?
015726  001013                                  BNE     SB6             ;BR TO ERROR HALT ON SEQ ERROR
015730  012767  125125  000030                  MOV     #125125,SB6X    ;MOVE PATTERN TO WORK LOCATION
015736  012700  015760                          MOV     #SB6X-6,R0      ;MOVE OFFSET POINTER TO R0
015742  000360  000006                          SWAB    6(R0)           ;TRY SWAB W/ MODE 6
015746  022760  052652  000006                  CMP     #52652,6(R0)    ;CHECK RESULT
015754  001405                                  BEQ     TS200
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
015756                                  SB6:
015756  012742  000405                          MOV     #405,-(R2)      ;MOVE TO MAILBOX #  *******  405  *******
015762  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015764  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
                                                                        ;  OR SEQUENCE ERROR
015766  000000                          SB6X:   0                       ;WORK LOCATION
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 7 SWAB INSTRUCTION.  THIS TEST
                                        ;USES TWO LOCATIONS FOLLOWING THE TEST CODE:  A WORK LOCATION
                                        ;(SB7X) AND A POINTER TO THE WORK LOCATION (SB7XAD).  DATA IS MOVED
                                        ;TO THE WORK LOCATION.  R0 IS LOADED WITH 72 LESS THAN THE ADDRESS
                                        ;OF THE ADDRESS POINTER.  THE DATA IS SWAB'ED USING A MODE 7
                                        ;INSTRUCTION WITH AN OFFSET OF +72.  THE DATA IS VERIFIED WITH A
                                        ;COMPARE.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 200       TEST MODE 7 W/ SWAB INST.
                                        ;*******************************************************************************
015770  005212                          TS200:  INC     (R2)            ;UPDATE TEST NUMBER
015772  022712  000200                          CMP     #200,(R2)       ;SEQUENCE ERROR?
015776  001013                                  BNE     SB7             ;BR TO ERROR HALT ON SEQ ERROR
016000  012767  177400  000030                  MOV     #177400,SB7X    ;MOVE PATTERN TO WORK LOCATION
016006  012700  015746                          MOV     #SB7XAD-72,R0   ;MOVE OFFSET POINTER TO R0
016012  000370  000072                          SWAB    @72(R0)         ;TRY SWAB MODE 7
016016  027027  000072  000377                  CMP     @72(R0),#377    ;CHECK RESULTS
016024  001406                                  BEQ     TS201
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
016026                                  SB7:
016026  012742  000406                          MOV     #406,-(R2)      ;MOVE TO MAILBOX #  *******  406  *******
016032  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016034  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
                                                                        ;  OR SEQUENCE ERROR
016036  000000                          SB7X:   0                       ;WORK LOCATION
016040  016036                          SB7XAD: SB7X                    ;POINTER TO WORK LOCATION
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES ALL LEGAL MODES OF THE JMP INSTRUCTION.
                                        ;BECAUSE OF THE NATURE OF THE INSTRUCTION UNDER TEST, THIS TEST
                                        ;UTILIZES SEVERAL DIFFERENT TECHNIQUES.  THE CODE IS NOT EXECUTED
                                        ;IN A LINEAR FASHION.  THE DIFFERENT MODES ARE EXECUTED IN ORDER
                                        ;FROM 1-7; HOWEVER, THE CODE IS ARRANGED SO THAT CONTROL LEAP
                                        ;FROGS THRU THE TEST CODE.  THE ORDER OF APPEARANCE OF THE CODE
                                        ;IS:
                                        ;       JMP MODE 1
                                        ;       JMP MODE 3
                                        ;       JMP MODE 2
                                        ;       JMP MODE 4
                                        ;       JMP MODE 6
                                        ;       JMP MODE 5
                                        ;       JMP MODE 7
                                        ;AN INTERNAL SEQUENCE TEST (JMPSEQ) IS USED TO INSURE THAT THE
                                        ;JUMPS ARE OCCURRING IN THE PROGRAMMED SEQUENCE.
                                        ;       THE TEST IS MADE UP OF SEVERAL BLOCKS OF CODE.  EACH CODE
                                        ;BEGINS WITH A LABEL WHICH INDICATES THE MODE BEING EXECUTED IN
                                        ;THAT BLOCK.  A SIMPLE PROCEDURE IS FOLLOWED IN EACH BLOCK.  FOR
                                        ;EXAMPLE THE CODE BEGINNING AT JMP3 WILL FIRST COMPARE THE RESULTS
                                        ;OF THE PREVIOUS MODE 2 JUMP.  (ANY REGISTER CHANGES ARE VERIFIED
                                        ;AND THE SEQUENCE CHECK IS MADE).  THEN THE REGISTERS ARE SETUP
                                        ;FOR A MODE 3 JUMP TO THE NEXT TEST BLOCK (HERE, JMP4), THE SEQUENCE
                                        ;CHECKER IS UPDATED AND THE JUMP IS EXECUTED.
                                        ;       IF A FAILURE OCCURS, THE SEQUENCE CHECKER WILL ASSIST IN
                                        ;DETERMINING JUST WHICH MODE FAILED.  IF THE SEQUENCE IS CORRECT
                                        ;THEN THE ERROR DETECTED WAS A MODE FAILURE (E.G. FAILURE OF THE
                                        ;REGISTER TO BE INCREMENTED IN MODE 2 JUMP.)
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 201       TEST THE JMP INSTRUCTION IN ALL MODES
                                        ;*******************************************************************************
016042  005212                          ;S201:  INC     (R2)            ;UPDATE TEST NUMBER
016044  022712  000201                          CMP     #201,(R2)       ;SEQUENCE ERROR?
016050  001150                                  BNE     JMPCK+6         ;BR TO ERROR HALT ON SEQ ERROR
016052  005067  000326                          CLR     JMPSEQ          ;ESTABLISH A SEQUENCE CHECKER
016056  012700  016136                          MOV     #JMP2,R0        ;SET R0=JUMP TARGET
016062  000110                                  JMP     (R0)            ;TRY JMP MODE 1
016064  022700  016066                  JMP3:   CMP     #.+2,R0         ;CHECK RESULT OF MODE 2 JUMP
016070  001404                                  BEQ     JMP3A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                        ;           WHICH FOLLOWS W/ 767            <--
016072  012742  000407                          MOV     #407,-(R2)      ;MOVE TO MAILBOX #  *******  407  *******
016076  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016100  000000                                  HALT                    ;REGISTER VALUE AFTER JMP MODE 2 INCORRECT
016102  026727  000276  000001          JMP3A:  CMP     JMPSEQ,#1       ;MAKE SURE JMPS ARE IN SEQUENCE: JMPSEQ=1?
016110  001404                                  BEQ     JMP3B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                        ;           WHICH FOLLOWS W/ 757            <--
```

```
016112  012742  000410                  MOV     #410,-(R2)      ;MOVE TO MAILBOX #  *******  410  *******
016116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016120  000000                          HALT                    ;SHOULD BE HERE FROM JMP MODE 2 ONLY
016122  012700  016134          JMP3B:  MOV     #IJMP4,R0       ;POINT R0 TO INDIRECT JMP ADDR.
016126  005267  000252                  INC     JMPSEQ          ;UPDATE SEQUENCE CHECKER
016132  000130                          JMP     @(R0)+          ;TRY JMP MODE 3
016134  016166          IJMP4:          JMP4                    ;ADDRESS INDIRECT JUMP

016136  005767  000242          JMP2:   TST     JMPSEQ          ;CHECK THAT JMPS ARE IN SEQUENCE: JMPSEQ=0?
016142  001404                          BEQ     JMP2A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 742            <====
016144  012742  000411                  MOV     #411,-(R2)      ;MOVE TO MAILBOX #  *******  411  *******
016150  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016152  000000                          HALT                    ;SHOULD BE HERE FROM JMP MODE 1 ONLY
016154  005267  000224          JMP2A:  INC     JMPSEQ          ;UPDATE SEQUENCE CHECKER
016160  012700  016064                  MOV     #JMP3,R0        ;SET R0=JUMP TARGET
016164  000120                          JMP     (R0)+           ;TRY A JUMP MODE 2 TO ''JMP3''
016166  022700  016136          JMP4:   CMP     #IJMP4+2,R0     ;CHECK RESULT OF REGISTER IN MODE 3 JUMP
016172  001404                          BEQ     JMP4A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 726            <
016174  012742  000412                  MOV     #412,-(R2)      ;MOVE TO MAILBOX #  *******  412  *******
016200  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016202  000000                          HALT                    ;REGISTER VALUE AFTER MODE 3 JUMP INCORRECT
016204  022767  000002  000172  JMP4A:  CMP     #2,JMPSEQ       ;CHECK JUMP SEQUENCE: JMPSEQ=2?
016212  001404                          BEQ     JMP4B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 716            <
016214  012742  000413                  MOV     #413,-(R2)      ;MOVE TO MAILBOX #  *******  413  *******
016220  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016222  000000                          HALT                    ;SHOULD BE ONLY FROM MODE 3 JUMP
016224  012700  016274          JMP4B:  MOV     #JMP5+2,R0      ;SET UP POINTER TO JUMP TARGET
016230  005267  000150                  INC     JMPSEQ          ;UPDATE SEQUENCE CHECKER
016234  000140                          JMP     -(R0)           ;TRY JUMP MODE 4 TO ''JMP4''

016236  022767  000004  000140  JMP6:   CMP     #4,JMPSEQ       ;CHECK THAT JUMPS ARE IN SEQUENCE: JMPSEQ=4?
016244  001404                          BEQ     JMP6A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==-=
                                                                ;           CONDITIONAL BRANCH INST. AND    <==-=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <==-=
                                                                ;           WHICH FOLLOWS W/ 701            <==-=
016246  012742  000414                  MOV     #414,-(R2)      ;MOVE TO MAILBOX #  *******  414  *******
016252  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016254  000000                          HALT                    ;SHOULD BE HERE ONLY FROM MODE 5 JUMP
016256  012700  016724          JMP6A:  MOV     #JMP7+376,R0    ;SET UP OFFSET POINTER TO JUMP TARGET
016262  005267  000116                  INC     JMPSEQ          ;UPDATE JUMP SEQUENCE
016266  000160  177402                  JMP     -376(R0)        ;TRY MODE 6 JUMP

016272  022767  000003  000104  JMP5:   CMP     #3,JMPSEQ       ;CHECK THAT JUMPS ARE IN SEQUENCE: JMPSEQ=3?
```

```
016300  001404                          BEQ     JMP5A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 663           <====
016302  012742  000415                  MOV     #415,-(R2)      ;MOVE TO MAILBOX #  *******  415  *******
016306  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016310  000000                          HALT                    ;SHOULD ONLY BE HERE FROM MODE 4 JUMP
016312  012700  016326          JMP5A:  MOV     #IJMP5+2,R0     ;SET UP POINTER TO INDIRECT JUMP ADDR.
016316  005267  000062                  INC     JMPSEQ          ;UPDATE JUMP SEQUENCE
016322  000150                          JMP     @-(R0)          ;TRY JUMP MODE 5 TO ''JMP6''
016324  016236          IJMP5:  JMP6                            ;INDIRECT ADDRESS POINTER

016326  022767  000005  000050  JMP7:   CMP     #5,JMPSEQ       ;CHECK JUMPS IN SEQUENCE: JMPSEQ=5?
016334  001404                          BEQ     JMP7A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 645           <====
016336  012742  000416                  MOV     #416,-(R2)      ;MOVE TO MAILBOX #  *******  416  *******
016342  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016344  000000                          HALT                    ;SHOULD ONLY BE HERE FROM MODE 6 JUMP
016346  012700  016372          JMP7A:  MOV     #IJMP+10,R0     ;SET UP OFFSET POINTER TO INDIRECT ADDR.
016352  005267  000026                  INC     JMPSEQ          ;UPDATE JUMP SEQUENCE
016356  000170  177770                  JMP     @-10(R0)        ;TRY MODE 7 JUMP
016362  016364          IJMP:   JMPCK                           ;INDIRECT ADDRESS

016364  026727  000014  000006  JMPCK:  CMP     JMPSEQ,#6       ;CHECK JUMPS IN SEQUENCE: JMPSEQ
016372  001405                          BEQ     TS202
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <--
                                                        ;           WHICH FOLLOWS W/ 626           <-
016374  012742  000417                  MOV     #417,-(R2)      ;MOVE TO MAILBOX #  *******  417  *******
016400  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016402  000000                          HALT                    ;SHOULD ONLY BE HERE FROM MODE 6 JUMP
                                                                ;  OR SEQUENCE ERROR

016404  000000          JMPSEQ: 0
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES ALL LEGAL MODES OF THE JSR INSTRUCTION.
                                        ;THE CONCEPT OF LEAP FROGGING AND SEQUENCE CHECKING (JSRSEQ) IS
                                        ;IDENTICAL TO THAT USED IN JMP TEST (SEE PREVIOUS TEST).  EACH
                                        ;BLOCK OF CODE VERIFIES THE PREVIOUS JSR BY CHECKING THE SEQUENCE,
                                        ;CHECKING THAT THE PC WAS SAVED IN THE SPECIFIED REGISTER, CHECKING
                                        ;THAT THE SP WAS DECREMENTED, CHECKING THAT THE REGISTER WAS
                                        ;SAVED ON THE STACK, AND FINALLY CHECKING THAT ANY MODE ADDRESS
                                        ;REGISTER ALTERATIONS (E.G. INCREMENT REGISTER IN MODE 2) WERE
                                        ;SUCCESSFUL.  R1 IS USED AS THE REGISTER IN ALL JSR INSTRUCTIONS.
                                        ;       IF A FAILURE OCCURS, THE SEQUENCE CHECKER WILL ASSIST IN
                                        ;DETERMINING JUST WHICH MODE FAILED.  IF THE SEQUENCE IS CORRECT
                                        ;THEN THE ERROR DETECTED WAS A FUNCTIONAL FAILURE (E.G., INCORRECT
                                        ;REGISTER SAVED).
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 202       TEST JSR INSTRUCTION W/ ALL MODES
                                        ;*******************************************************************************
016406  005212                          TS202:  INC     (R2)            ;UPDATE TEST NUMBER
016410  022712  000202                          CMP     #202,(R2)       ;SEQUENCE ERROR?
016414  001001                                  BNE     JSR0            ;BR TO ERROR HALT ON SEQ ERROR
016416  000402                                  BR      JSR1
016420  000137  017054                  JSR0:   JMP     @#JSRCK1

016424  012706  001000                  JSR1:   MOV     #STBOT,R6       ;SET STACK POINTER
016430  012700  016536                          MOV     #JSR2,R0        ;SET TARGET ADDRESS
016434  005037  017034                          CLR     @#JSRSEQ        ;INITIALIZE SEQUENCE CHECKER
016440  005001                                  CLR     R1              ;INITIALIZE R1
016442  005101                                  COM     R1
016444  004110                                  JSR     R1,(R0)         ;TRY JSR MODE 1
                                                                        ; TO SCOPE: REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           FOLLOWING W/ 774               <
016446                                  JSR1A:
016446  012742  000420                          MOV     #420,-(R2)      ;MOVE TO MAILBOX #  *******  420  *******
016452  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016454  000000                                  HALT                    ;JSR MODE 1 FAILED

016456  022737  000001  017034          JSR3:   CMP     #1,@# JSRSEQ    ;CHECK SEQUENCE: JSRSEQ-1?
016464  001014                                  BNE     JSR3A           ;BRANCH IF OUT OF SEQUENCE
016466  020127  016620                          CMP     R1,#JSR4        ;PROPER PC SAVED?
016472  001011                                  BNE     JSR3A           ;BRANCH IF PC WRONG
016474  022706  000776                          CMP     #STBOT-2,R6     ;STACK POINTER DECREMENTED?
016500  001006                                  BNE     JSR3A           ;BRANCH IF SP WRONG
016502  022716  125252                          CMP     #125252,(R6)    ;REG SAVED ON STACK?
016506  001003                                  BNE     JSR3A           ;BRANCH IF REG. NOT SAVED
016510  022700  016460                          CMP     #JSR3+2,R0      ;MODE 2 INCREMENT CORRECT?
016514  001404                                  BEQ     JSR3B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                        ;           WHICH FOLLOWS W/ 737           <---
016516                                  JSR3A:
016516  012742  000421                          MOV     #421,-(R2)      ;MOVE TO MAILBOX #  *******  421  *******
016522  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
016524  000000                          HALT                    ;JSR MODE 3 MALFUNCTIONED
016526  005237  017034          JSR3B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016532  004137  016620                  JSR     R1,@#JSR4       ;TRY JSR MODE 4

016536  005737  017034          JSR2:   TST     @#JSRSEQ        ;CHECK SEQUENCE: JSRSEQ=0?
016542  001011                          BNE     JSR2A           ;BRANCH IF OUT OF SEQUENCE
016544  020127  016446                  CMP     R1,#JSR1A       ;PROPER PC SAVED?
016550  001006                          BNE     JSR2A           ;BRANCH IF PC WRONG
016552  022706  000776                  CMP     #STBOT-2,R6     ;R6 DECREMENT?
016556  001003                          BNE     JSR2A           ;BRANCH IF R6 IS INCORRECT
016560  021627  177777                  CMP     (R6),#-1        ;REGISTER SAVED?
016564  001404                          BEQ     JSR2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-- -
                                                                ;           CONDITIONAL BRANCH INST. AND    <-=-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <== =
                                                                ;           WHICH FOLLOWS W/ 713            <===-
016566                          JSR2A:
016566  012742  000422                  MOV     #422,-(R2)      ;MOVE TO MAILBOX #  *******  422  *******
016572  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016574  000000                          HALT                    ;JSR MODE 1 MALFUNCTIONED
016576  012706  001000          JSR2B:  MOV     #STBOT,R6       ;INITIALIZE R6
016602  012701  125252                  MOV     #125252,R1      ;INITIALIZE R1
016606  005237  017034                  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016612  012700  016456                  MOV     #JSR3,R0        ;SET TARGET ADDRESS
016616  004120                          JSR     R1,(R0)+        ;TRY JSR MODE 2

016620  022737  000002  017034  JSR4:   CMP     #2,@#JSRSEQ     ;CHECK SEQUENCE: JSRSEQ=2?
016626  001003                          BNE     JSR4A           ;BRANCH IF OUT OF SEQUENCE
016630  022701  016536                  CMP     #JSR2,R1        ;PROPER PC SAVED?
016634  001404                          BEQ     JSR4B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=-==
                                                                ;           CONDITIONAL BRANCH INST. AND    <-=-=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=- -
                                                                ;           WHICH FOLLOWS W/ 667            <===-
016636                          JSR4A:
016636  012742  000423                  MOV     #423,-(R2)      ;MOVE TO MAILBOX #  *******  423  *******
016642  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016644  000000                          HALT                    ;JSR MODE 3 MALFUNCTIONED
016646  005237  017034          JSR4B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016652  012700  016726                  MOV     #JSR5+2,R0      ;SET TARGET ADDRESS
016656  004140                          JSR     R1,-(R0)        ;TRY JSR MODE 4

016660  022767  000004  000146  JSR6:   CMP     #4,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ-4?
016666  001006                          BNE     JSR6A           ;BRANCH IF OUT OF SEQUENCE
016670  022701  016772                  CMP     #JSR7,R1        ;PROPER PC SAVED?
016674  001003                          BNE     JSR6A           ;BRANCH IF PC WRONG
016676  022700  017030                  CMP     #JSR6AD,R0      ;MODE 5 REGISTER CORRECT?
016702  001404                          BEQ     JSR6B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 644            <====
016704                          JSR6A:
016704  012742  000424                  MOV     #424,-(R2)      ;MOVE TO MAILBOX #  *******  424  *******
016710  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016712  000000                          HALT                    ;JSR MODE 5 FAILED
```

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016714  005237  017034          JSR6B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016720  004167  000046                  JSR     R1,JSR7         ;TRY JSR MODE 6
016724  022767  000003  000102  JSR5:   CMP     #3,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ=3?
016732  001006                          BNE     JSR5A           ;BRANCH IF OUT OF SEQUENCE
016734  022701  016660                  CMP     #JSR6,R1        ;PROPER PC SAVED?
016740  001003                          BNE     JSR5A           ;BRANCH IF PC WRONG
016742  022700  016724                  CMP     #JSR5,R0        ;CHECK MODE 4 REGISTER
016746  001404                          BEQ     JSR5B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                                ;           CONDITIONAL BRANCH INST. AND   <===
                                                                ;           REPLACE THE MOVE INSTRUCTION   <===
                                                                ;           WHICH FOLLOWS W/ 622           <---
016750                          JSR5A:
016750  012742  000425                  MOV     #425,-(R2)      ;MOVE TO MAILBOX #  *******  425  *******
016754  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016756  000000                          HALT                    ;JSR MODE 4 MALFUNCTIONED
016760  005237  017034          JSR5B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016764  012700  017032                  MOV     #JSR6AD+2,R0    ;POINT R0 TO TARGET ADDRESS
016770  004150                          JSR     R1,@-(R0)       ;TRY JSR MODE 5

016772  022737  000005  017034  JSR7:   CMP     #5,@#JSRSEQ     ;CHECK SEQUENCE: JSRSEQ=5?
017000  001003                          BNE     JSR7A           ;BRANCH IF OUT OF SEQUENCE
017002  022701  016724                  CMP     #JSR5,R1        ;PROPER PC SAVED?
017006  001404                          BEQ     JSR7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;           CONDITIONAL BRANCH INST. AND   <---
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                ;           WHICH FOLLOWS W/ 602           <
017010                          JSR7A:
017010  012742  000426                  MOV     #426,-(R2)      ;MOVE TO MAILBOX #  *******  426  *******
017014  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017016  000000                          HALT                    ;JSR MODE 6 FAILED
017020  005237  017034          JSR7B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
017024  004177  000002                  JSR     R1,@JSRCKAD     ;TRY JSR MODE 7

017030  016660                  JSR6AD: JSR6                    ;MODE 5 TARGET ADDRESS
017032  017036                  JSRCKAD:JSRCK                   ;MODE 7 TARGET ADDRESS
017034  000000                  JSRSEQ: 0                       ;SEQUENCE CHECKER

017036  022767  000006  177770  JSRCK:  CMP     #6,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ=6?
017044  001003                          BNE     JSRCK1          ;BRANCH IF OUT OF SEQUENCE
017046  022701  017030                  CMP     #JSR6AD,R1      ;PROPER PC SAVED?
017052  001404                          BEQ     TS203
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;           CONDITIONAL BRANCH INST. AND   <---
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                ;           WHICH FOLLOWS W/ 560           <---
017054                          JSRCK1:
017054  012742  000427                  MOV     #427,-(R2)      ;MOVE TO MAILBOX #  *******  427  *******
017060  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017062  000000                          HALT                    ;JSR MODE 7 MALFUNCTIONED
                                                                ;  OR SEQUENCE EPROR
```

```
                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE RTS INSTRUCTION.  THE STACK POINTER
                                ;IS INITIALIZED AND A TEST PATTERN STORED ON STACK.  R0 IS LOADED
                                ;WITH RETURN ADDRESS.  AN RTS IS EXECUTED, AND, AT THE TARGET
                                ;ADDRESS, A CHECK IS MADE THAT R0 WAS PROPERLY RESTORED FROM THE
                                ;STACK.
                                ;*******************************************************************************
                                ;TEST 203       TEST RTS INSTRUCTION
                                ;*******************************************************************************
017064  005212                  TS203:  INC     (R2)            ;UPDATE TEST NUMBER
017066  022712  000203                  CMP     #203,(R2)       ;SEQUENCE ERROR?
017072  001016                          BNE     TS204-.         ;BR TO ERROR HALT ON SEQ ERROR
017074  012706  001000                  MOV     #STBOT,R6       ;INITIALIZE STACK POINTER
017100  012746  052525                  MOV     #52525,-(R6)    ;INITIALIZE TOP OF STACK
017104  012700  017122                  MOV     #RTS1,R0        ;INITIALIZE RETURN REGISTER
017110  000200                          RTS     R0              ;TRY RTS THROUGH R0
                                                                ; TO SCOPE: REPLACE THE MOVE INSTRUCTION   <
                                                                ;           FOLLOWING W/ 770               <
017112  012742  000430                  MOV     #430,-(R2)      ;MOVE TO MAILBOX #  *******  430  *******
017116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017120  000000                          HALT                    ;RTS FAILED
017122  022700  052525          RTS1:   CMP     #52525,R0       ;CHECK THAT R0 RESTORED FROM STACK
017126  001404                          BEQ     TS204
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 761           <
017130  012742  000431                  MOV     #431,-(R2)      ;MOVE TO MAILBOX #  *******  431  *******
017134  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017136  000000                          HALT                    ;RTS MALFUNCTIONED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT FOUR TESTS VERIFY THE FUNCTIONING OF A GROUP
                                        ;OF FOUR INSTRUCTIONS.  THE GROUP CONSISTS OF THE INSTRUCTIONS:
                                        ;MOV, BIC, BIT, AND BIS.  THESE INSTRUCTIONS ARE SIMILAR IN THE
                                        ;WAY THEY EFFECT THE C AND V BITS.  THEY ALL LEAVE THE V-BIT
                                        ;CLEAR AND THE C-BIT UNAFFECTED.
                                        ;       THE TEST PROCEDURE IS AS FOLLOWS:  THE N, Z, AND V BITS
                                        ;ARE LOADED WITH THE COMPLEMENT OF THE EXPECTED RESULTS, THE C-BIT
                                        ;IS LOADED WITH THE DESIRED RESULT.  THE INSTRUCTION IS EXECUTED
                                        ;WITH DIFFERENT DATA PATTERNS AND THE RESULTS ARE VERIFIED WITH
                                        ;A SERIES OF CONDITIONAL BRANCH INSTRUCTIONS.  THE DATA IS CHOSEN
                                        ;TO PRODUCT ALL POSSIBLE COMBINATIONS OF THE C AND V BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 204       TEST MOV INSTRUCTION
                                        ;*******************************************************************************
017140  005212                          TS204:  INC     (R2)            ;UPDATE TEST NUMBER
017142  022712  000204                          CMP     #204,(R2)       ;SEQUENCE ERROR?
017146  001022                                  BNE     TS205-10        ;BR TO ERROR HALT ON SEQ ERROR
017150  000277                                  SCC                     ;CC=0110
017152  000251                                  +CLN.CLC
017154  012700  100000                          MOV     #100000,R0      ;CC=1000
017160  101402                                  BLOS    MOV1
017162  102401                                  BVS     MOV1
017164  100404                                  BMI     MOV2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 770            <
017166                                  MOV1:
017166  012742  000432                          MOV     #432,-(R2)      ;MOVE TO MAILBOX #  *******  432  *******
017172  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017174  000000                                  HALT                    ;MOV DID NOT SET CC'S CORRECTLY

017176  000277                          MOV2:   SCC                     ;CC=1011
017200  000244                                  CLZ
017202  012700  000000                          MOV     #0,R0           ;CC=0101
017206  101002                                  BHI     MOV3            ;C OR Z = 0?
017210  102401                                  BVS     MOV3            ;V=1?
017212  100004                                  BPL     TS205
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 755            <-
017214                                  MOV3:
017214  012742  000433                          MOV     #433,-(R2)      ;MOVE TO MAILBOX #  *******  433  *******
017220  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017222  000000                                  HALT                    ;MOV DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;TEST 205       TEST BIT INSTRUCTION
                                        ;*******************************************************************************
017224  005212                          TS205:  INC     (R2)            ;UPDATE TEST NUMBER
017226  022712  000205                          CMP     #205,(R2)       ;SEQUENCE ERROR?
017232  001024                                  BNE     TS206-10        ;BR TO ERROR HALT ON SEQ ERROR
```

```
017234  012700  100001                  MOV     #100001,R0
017240  000277                          SCC                             ;CC=0110
017242  000251                          +CLN!CLC
017244  032700  100000                  BIT     #100000,R0              ;CC=1000
017250  101402                          BLOS    BIT1
017252  102401                          BVS     BIT1
017254  100404                          BMI     BIT2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
017256                          BIT1:
017256  012742  000434                  MOV     #434,-(R2)              ;MOVE TO MAILBOX #  *******  434  *******
017262  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017264  000000                          HALT                            ;BIT DID NOT SET CC'S CORRECTLY

017266  000277                  BIT2:   SCC                             ;CC=1011
017270  000244                          CLZ
017272  032700  077776                  BIT     #77776,R0               ;CC=0101
017276  101002                          BHI     BIT3
017300  102401                          BVS     BIT3
017302  100004                          BPL     TS206
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 753            <
017304                          BIT3:
017304  012742  000435                  MOV     #435,-(R2)              ;MOVE TO MAILBOX #  *******  435  *******
017310  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017312  000000                          HALT                            ;BIT DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 206       TEST BIC INSTRUCTION
                                ;*******************************************************************************
017314  005212                  TS206:  INC     (R2)                    ;UPDATE TEST NUMBER
017316  022712  000206                  CMP     #206,(R2)               ;SEQUENCE ERROR?
017322  001024                          BNE     TS207-10                ;BR TO ERROR HALT ON SEQ ERROR
017324  012700  177777                  MOV     #177777,R0
017330  000277                          SCC                             ;CC=0110
017332  000251                          +CLN!CLC
017334  042700  077777                  BIC     #77777,R0               ;CC=1000
017340  101402                          BLOS    BIC1
017342  102401                          BVS     BIC1
017344  100404                          BMI     BIC2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 766            <
017346                          BIC1:
017346  012742  000436                  MOV     #436,-(R2)              ;MOVE TO MAILBOX #  *******  436  *******
017352  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017354  000000                          HALT                            ;BIC DID NOT SET CC'S CORRECTLY
017356  000277                  BIC2:   SCC                             ;CC=1011
017360  000244                          CLZ
017362  042700  100000                  BIC     #100000,R0              ;CC=0101
017366  101002                          BHI     BIC3
```

```
017370  102401                          BVS     BIC3
017372  100004                          BPL     TS207
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 753           <====
017374                          BIC3:
017374  012742  000437                  MOV     #437,-(R2)      ;MOVE TO MAILBOX #  *******  437  *******
017400  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017402  000000                          HALT                    ;BIC DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 207       TEST BIS INSTRUCTION
                                ;*******************************************************************
017404  005212                  TS207:  INC     (R2)            ;UPDATE TEST NUMBER
017406  022712  000207                  CMP     #207,(R2)       ;SEQUENCE ERROR?
017412  001025                          BNE     TS210-10        ;BR TO ERROR HALT ON SEQ ERROR
017414  005000                          CLR     R0              ;R0=0
017416  000277                          SCC                     ;CC=1010
017420  000251                          +CLN!CLC
017422  052700  000000                  BIS     #0,R0           ;CC=0100  R0=0
017426  103403                          BCS     BIS1
017430  102402                          BVS     BIS1
017432  100401                          BMI     BIS1
017434  001404                          BEQ     BIS2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 766           <
017436                          BIS1:
017436  012742  000440                  MOV     #440,-(R2)      ;MOVE TO MAILBOX #  *******  440  *******
017442  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017444  000000                          HALT                    ;BIS DID NOT SET CC'S CORRECTLY
017446  000277                  BIS2:   SCC                     ;CC=0111
017450  000250                          CLN
017452  052700  177777                  BIS     #177777,R0      ;CC=1001
017456  103003                          BCC     BIS3
017460  102402                          BVS     BIS3
017462  001401                          BEQ     BIS3
017464  100404                          BMI     TS210
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 752           <
017466                          BIS3:
017466  012742  000441                  MOV     #441,-(R2)      ;MOVE TO MAILBOX #  *******  441  *******
017472  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017474  000000                          HALT                    ;BIS DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT TWO TESTS VERIFY THE FUNCTIONING OF THE INC AND
                                        ;DEC INSTRUCTIONS.  THESE INSTRUCTIONS BOTH EFFECT THE C AND V
                                        ;BITS THE SAME; THE C-BIT IS LEFT UNCHANGED AND THE V-BIT IS DEPENDENT
                                        ;UPON THE DATA RESULTS.  THE SAME PROCEDURE IS USED.  THE CONDITION
                                        ;CODE BITS ARE INITIALIZED, THE INSTRUCTION IS EXECUTED AND THE
                                        ;RESULTS ARE VERIFIED WITH A SERIES OF CONDITIONAL BRANCH INSTRUCTIONS.
                                        ;THIS PROCEDURE IS REPEATED WITH SEVERAL DATA PATTERNS TO PRODUCE
                                        ;DIFFERENT COMBINATIONS OF THE C AND V BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 210       TEST INC INSTRUCTION
                                        ;*******************************************************************************
017476  005212                          TS210:  INC     (R2)            ;UPDATE TEST NUMBER
017500  022712  000210                          CMP     #210,(R2)       ;SEQUENCE ERROR?
017504  001037                                  BNE     TS211-10        ;BR TO ERROR HALT ON SEQ ERROR
017506  012700  077777                          MOV     #077777,R0      ;R0=077777
017512  000257                                  CCC                     ;CC=0100
017514  000264                                  SEZ
017516  005200                                  INC     R0              ;CC=1010   R0=10000
017520  101402                                  BLOS    INC1
017522  100001                                  BPL     INC1
017524  102404                                  BVS     INC2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 767           <
017526                                  INC1:
017526  012742  000442                          MOV     #442,-(R2)      ;MOVE TO MAILBOX #  *******  442  *******
017532  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017534  000000                                  HALT                    ;INC DID NOT SET CC'S CORRECTLY
017536  052700  077777                  INC2:   BIS     #77777,R0       ;R0=177777
017542  000261                                  SEC                     ;CC=1011
017544  000244                                  CLZ
017546  005200                                  INC     R0              ;CC=0101   R0-0
017550  100403                                  BMI     INC3
017552  102402                                  BVS     INC3
017554  103001                                  BCC     INC3
017556  001404                                  BEQ     INC4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                        ;           CONDITIONAL BRANCH INST. AND   <=
                                                                        ;           REPLACE THE MOVF INSTRUCTION   <--
                                                                        ;           WHICH FOLLOWS W/ 752           <---
017560                                  INC3:
017560  012742  000443                          MOV     #443,-(R2)      ;MOVE TO MAILBOX #  *******  443  *******
017564  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017566  000000                                  HALT                    ;INC DID NOT SET CC'S CORRECTLY

017570  000277                          INC4:   SCC                     ;CC=1110
017572  000241                                  CLC
017574  005200                                  INC     R0              ;CC=0000   R0=1
017576  101402                                  BLOS    INC5
017600  100401                                  BMI     INC5
017602  100004                                  BPL     TS211
```

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                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                ;           WHICH FOLLOWS W/ 740            <--
017604                          INC5:
017604  012742  000444                  MOV     #444,-(R2)      ;MOVE TO MAILBOX #  *******  444  *******
017610  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017612  000000                          HALT                    ;INC DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 211       TEST DEC INSTRUCTION
                                ;*******************************************************************
017614  005212                  TS211:  INC     (R2)            ;UPDATE TEST NUMBER
017616  022712  000211                  CMP     #211,(R2)       ;SEQUENCE ERROR?
017622  001051                          BNE     TS212-10        ;BR TO ERROR HALT ON SEQ ERROR
017624  012700  000002                  MOV     #2,R0           ;R0=2
017630  000277                          SCC                     ;CC=1111
017632  005300                          DEC     R0              ;CC=0001   R0-1
017634  100403                          BMI     DEC1
017636  001402                          BEQ     DEC1
017640  102401                          BVS     DEC1
017642  103404                          BCS     DEC2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                ;           WHICH FOLLOWS W/ 767            <--
017644                          DEC1:
017644  012742  000445                  MOV     #445,-(R2)      ;MOVE TO MAILBOX #  *******  445  *******
017650  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017652  000000                          HALT                    ;DEC DID NOT SET CC'S CORRECTLY
017654  000261                  DEC2:   SEC                     ;CC=1011
017656  000244                          CLZ
017660  005300                          DEC     R0              ;CC=0101   R0=0
017662  101002                          BHI     DEC3
017664  100401                          BMI     DEC3
017666  102004                          BVC     DEC4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                ;           WHICH FOLLOWS W/ 755
017670                          DEC3:
017670  012742  000446                  MOV     #446,-(R2)      ;MOVE TO MAILBOX #  *******  446  *******
017674  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017676  000000                          HALT                    ;DEC DID NOT SET CC'S CORRECTLY
017700  000277                  DEC4:   SCC                     ;CC=0110
017702  000251                          +CLN!CLC
017704  005300                          DEC     R0              ;CC=1000   R0=177777
017706  101402                          BLOS    DEC5
017710  102401                          BVS     DEC5
017712  100404                          BMI     DEC6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                ;           WHICH FOLLOWS W/ 743            <--
017714                          DEC5:
```

```
017714  012742  000447                  MOV     #447,-(R2)      ;MOVE TO MAILBOX #  *******  447  *******
017720  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017722  000000                          HALT                    ;DEC DID NOT SET CC'S CORRECTLY
017724  042700  077777          DEC6:   BIC     #77777,R0       ;R0=100000
017730  000277                          SCC                     ;CC=0101
017732  000252                          +CLN!CLV
017734  005300                          DEC     R0              ;CC=1011    R0=77777
017736  100403                          BMI     DEC7            ;CC=0011
017740  001402                          BEQ     DEC7
017742  102001                          BVC     DEC7
017744  103404                          BCS     TS212
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                ;           CONDITIONAL BRANCH INST. AND   <----
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 726           <----
017746                          DEC7:
017746  012742  000450                  MOV     #450,-(R2)      ;MOVE TO MAILBOX #  *******  450  *******
017752  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017754  000000                          HALT                    ;DEC DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THESE NEXT THREE TESTS VERIFY THE FUNCTIONING OF THE CLR,
                                        ;TST, AND SWAB INSTRUCTIONS.  THESE THREE INSTRUCTIONS ALL LEAVE
                                        ;THE C AND V BITS CLEARED.  AGAIN, THE CONDITION CODES ARE PRESET,
                                        ;THE INSTRUCTION EXECUTED AND THE RESULTS CHECKED WITH CONDITIONAL
                                        ;BRANCH INSTRUCTIONS.  THE PROCEDURE IS REPEATED TO PRODUCE OTHER
                                        ;COMBINATIONS OF CONDITION CODES.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 212       TEST CLR INSTRUCTION
                                        ;*******************************************************************
017756  005212                          TS212:  INC     (R2)            ;UPDATE TEST NUMBER
017760  022712  000212                          CMP     #212,(R2)       ;SEQUENCE ERROR?
017764  001007                                  BNE     TS213-10        ;BR TO ERROR HALT ON SEQ ERROR
017766  000277                                  SCC                     ;CC=1011
017770  000244                                  CLZ
017772  005000                                  CLR     R0              ;CC=0100   R0-0
017774  100403                                  BMI     CLR1
017776  102402                                  BVS     CLR1
020000  103401                                  BCS     CLR1
020002  001404                                  BEQ     TS213
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 770           <
020004                                  CLR1:
020004  012742  000451                          MOV     #451,-(R2)      ;MOVE TO MAILBOX #  *******  451  *******
020010  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020012  000000                                  HALT                    ;CLR DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR


                                        ;*******************************************************************
                                        ;TEST 213       TEST TST INSTRUCTION
                                        ;*******************************************************************
020014  005212                          TS213:  INC     (R2)            ;UPDATE TEST NUMBER
020016  022712  000213                          CMP     #213,(R2)       ;SEQUENCE ERROR?
020022  001022                                  BNE     TS214-10        ;BR TO ERROR HALT ON SEQ ERROR
020024  000277                                  SCC                     ;CC=1011
020026  000244                                  CLZ
020030  005700                                  TST     R0              ;CC=0100
020032  100403                                  BMI     TEST1
020034  102402                                  BVS     TEST1
020036  103401                                  BCS     TEST1
020040  001404                                  BEQ     TEST2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 770           <
020042                                  TEST1:
020042  012742  000452                          MOV     #452,-(R2)      ;MOVE TO MAILBOX #  *******  452  *******
020046  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020050  000000                                  HALT                    ;TEST DID NOT SET CC'S CORRECTLY
020052  005300                          TEST2:  DEC     R0              ;MAKE R0 NEGATIVE
020054  000277                                  SCC                     ;CC=0111
```

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020056  000250                          CLN
020060  005700                          TST     R0              ;CC=1000
020062  101402                          BLOS    TEST3
020064  102401                          BVS     TEST3
020066  100404                          BMI     TS214
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 755            <====
020070                          TEST3:
020070  012742  000453                  MOV     #453,-(R2)      ;MOVE TO MAILBOX #  *******  453  *******
020074  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020076  000000                          HALT                    ;TEST DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 214       TEST SWAB INSTRUCTION
                                ;*******************************************************************************
020100  005212                  TS214:  INC     (R2)            ;UPDATE TEST NUMBER
020102  022712  000214                  CMP     #214,(R2)       ;SEQUENCE ERROR?
020106  001023                          BNE     TS215-10        ;BR TO ERROR HALT ON SEQ ERROR
020110  012700  170000                  MOV     #170000,R0      ;R0=170000
020114  000277                          SCC                     ;CC=0111
020116  000250                          CLN
020120  000300                          SWAB    R0              ;CC=1000   R0-360
020122  101402                          BLOS    SWB1
020124  102401                          BVS     SWB1
020126  100404                          BMI     SWB2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                                ;           CONDITIONAL BRANCH INST. AND    <-= =
                                                                ;           REPLACE THE MOVE INSTRUCTION    <- =
                                                                ;    .      WHICH FOLLOWS W/ 767            <
020130                          SWB1:
020130  012742  000454                  MOV     #454,-(R2)      ;MOVE TO MAILBOX #  *******  454  *******
020134  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020136  000000                          HALT                    ;SWAB DID NOT SET CC'S CORRECTLY
020140  000277                  SWB2:   SCC                     ;CC=1011
020142  000244                          CLZ
020144  000300                          SWAB    R0              ;CC=0100   R0-170000
020146  102403                          BVS     SWB3
020150  103402                          BCS     SWB3
020152  100401                          BMI     SWB3
020154  001404                          BEQ     TS215
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=-
                                                                ;           WHICH FOLLOWS W/ 754            <
020156                          SWB3:
020156  012742  000455                  MOV     #455,-(R2)      ;MOVE TO MAILBOX #  *******  455  *******
020162  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020164  000000                          HALT                    ;
```

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                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT TWO TESTS VERIFY THE FUNCTIONING OF THE ADD AND
                                        ;ADC INSTRUCTIONS.  BOTH OF THESE INSTRUCTIONS HANDLE THE C AND
                                        ;V BITS IDENTICALLY.  THE PROCEDURE IS TO PRESET THE CONDITION
                                        ;CODES, EXECUTE THE INSTRUCTION WITH A PARTICULAR SET OF DATA, AND
                                        ;THEN CHECK THE RESULTS BY EXECUTING A SERIES OF CONDITIONAL
                                        ;BRANCHES.  THES PROCEDURE IS REPEATED SEVERAL TIMES WITH DIFFERENT
                                        ;DATA TO PRODUCE EVERY COMBINATION OF C AND V BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 215       TEST ADD INSTRUCTION
                                        ;*******************************************************************************
020166  005212                          TS215:  INC     (R2)            ;UPDATE TEST NUMBER
020170  022712  000215                          CMP     #215,(R2)       ;SEQUENCE ERROR?
020174  001062                                  BNE     TS216           ;BR TO ERROR HALT ON SEQ ERROR
020176  012700  040000                          MOV     #40000,R0       ;R0=40000
020202  000277                                  SCC                     ;CC=1111
020204  062700  030000                          ADD     #30000,R0       ;CC=0000   R0=70000
020210  101402                                  BLOS    ADD1
020212  102401                                  BVS     ADD1
020214  100004                                  BPL     ADD2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 767            <====
020216                                  ADD1:
020216  012742  000456                          MOV     #456,-(R2)      ;MOVE TO MAILBOX #  *******  456  *******
020222  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020224  000000                                  HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020226  000264                          ADD2:   SEZ                     ;CC=0100

020230  062700  010000                          ADD     #10000,R0       ;CC=1010   40=100000
020234  101402                                  BLOS    ADD3
020236  102001                                  BVC     ADD3
020240  100404                                  BMI     ADD4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 755            <====
020242                                  ADD3:
020242  012742  000457                          MOV     #457,-(R2)      ;MOVE TO MAILBOX #  *******  457  *******
020246  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020250  000000                                  HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020252  000257                          ADD4:   CCC                     ;CC=1000
020254  000270                                  SEN
020256  062700  100000                          ADD     #100000,R0      ;CC=0111   R0=0
020262  101002                                  BHI     ADD5
020264  102001                                  BVC     ADD5
020266  100004                                  BPL     ADD6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 742            <====
020270                                  ADD5:
```

```
020270  012742  000460                  MOV     #460,-(R2)      ;MOVE TO MAILBOX #  *******  460  *******
020274  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020276  000000                          HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020300  062700  177777          ADD6:   ADD     #177777,R0      ;CC=1000   R0=177777
020304  101402                          BLOS    ADD7
020306  102401                          BVS     ADD7
020310  100404                          BMI     ADD8
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===-
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 731           <====
020312                          ADD7:
020312  012742  000461                  MOV     #461,-(R2)      ;MOVE TO MAILBOX #  *******  461  *******
020316  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020320  000000                          HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020322  000277                  ADD8:   SCC                     ;CC=1010
020324  000245                          +CLC!CLZ
020326  062700  000001                  ADD     #1,R0           ;CC=0101   R=0
020332  102403                          BVS     ADD9
020334  103002                          BCC     ADD9
020336  100401                          BMI     ADD9
020340  001404                          BEQ     TS216
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--=-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=--=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <= --
                                                                ;           WHICH FOLLOWS W/ 715           <-  -
020342                          ADD9:
020342  012742  000462                  MOV     #462,-(R2)      ;MOVE TO MAILBOX #  *******  462  *******
020346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020350  000000                          HALT                    ;ADD DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 216       TEST ADC INSTRUCTION
                                ;*******************************************************************************
020352  005212                  TS216:  INC     (R2)            ;UPDATE TEST NUMBER
020354  022712  000216                  CMP     #216,(R2)       ;SEQUENCE ERROR?
020360  001037                          BNE     TS217-10        ;BR TO ERROR HALT ON SEQ ERROR
020362  012700  077777                  MOV     #077777,R0
020366  000277                          SCC                     ;CC=0101
020370  000252                          +CLN!CLV
020372  005500                          ADC     R0              ;CC=1010
020374  101402                          BLOS    ADC1
020376  102001                          BVC     ADC1
020400  100404                          BMI     ADC2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                                ;           WHICH FOLLOWS W/ 767           <-
020402                          ADC1:
020402  012742  000463                  MOV     #463,-(R2)      ;MOVE TO MAILBOX #  *******  463  *******
020406  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020410  000000                          HALT                    ;ADC DID NOT SET CC'S CORRECTLY
020412  052700  077777          ADC2:   BIS     #77777,R0
020416  000277                          SCC                     ;CC=1011
020420  000244                          CLZ
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020422  005500                          ADC     R0              ;CC=0101   R0=0
020424  101002                          BHI     ADC3
020426  102401                          BVS     ADC3
020430  100004                          BPL     ADC4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 753           <====
020432                          ADC3:
020432  012742  000464                  MOV     #464,-(R2)      ;MOVE TO MAILBOX #  *******  464  *******
020436  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020440  000000                          HALT                    ;ADC DID NOT SET CC'S CORRECTLY
020442  000277                  ADC4:   SCC
020444  000245                          +CLZ!CLC                        ;CC=1010
020446  005500                          ADC     R0              ;CC=0100
020450  102403                          BVS     ADC5
020452  103402                          BCS     ADC5
020454  100401                          BMI     ADC5
020456  001404                          BEQ     TS217
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 740           <====
020460                          ADC5:
020460  012742  000465                  MOV     #465,-(R2)      ;MOVE TO MAILBOX #  *******  465  *******
020464  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020466  000000                          HALT                    ;ADC DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
```

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                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT THREE TESTS VERIFY THE FUNCTIONING OF THE NEG,
                                        ;CMP, AND COM INSTRUCTIONS.  EACH OF THESE INSTRUCTIONS GENERATE
                                        ;THE C AND V BITS IDENTICALLY.  THE CONDITION CODES ARE PRESET,
                                        ;THE INSTRUCTIONS EXECUTED, AND THE RESULTS CHECKED WITH A SERIES
                                        ;OF CONDITIONAL BRANCH INSTRUCTIONS.  THIS PROCEDURE IS REPEATED
                                        ;SEVERAL TIMES WITH DIFFERENT DATA IN ORDER TO GENERATF DIFFERENT
                                        ;COMBINATIONS OF THE C AND V BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 217       TEST NEG INSTRUCTION
                                        ;*******************************************************************************
020470  005212                          TS217:  INC     (R2)            ;UPDATE TEST NUMBER
020472  022712  000217                          CMP     #217,(R2)       ;SEQUENCE ERROR?
020476  001042                                  BNE     TS220-10        ;BR TO ERROR HALT ON SEQ ERROR
020500  012700  000001                          MOV     #1,R0
020504  000277                                  SCC                     ;CC=0110
020506  000251                                  +CLN!CLC
020510  005400                                  NEG     R0              ;CC=1001   R0=177777
020512  103003                                  BCC     NEG1
020514  102402                                  BVS     NEG1
020516  001401                                  BEQ     NEG1
020520  100404                                  BMI     NEG2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=--
                                                                        ;           CONDITIONAL BRANCH INST. AND   <--
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                        ;           WHICH FOLLOWS W/ 766           <- -
020522                                  NEG1:
020522  012742  000466                          MOV     #466,-(R2)      ;MOVE TO MAILBOX #  *******  466  *******
020526  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020530  000000                                  HALT                    ;NEG DID NOT SET CC'S CORRECTLY
020532  042700  077777                  NEG2:   BIC     #77777,R0
020536  000257                                  CCC                     ;CC=0100
020540  000264                                  SEZ
020542  005400                                  NEG     R0              ;CC=1011   R0-100000
020544  102003                                  BVC     NEG3
020546  103002                                  BCC     NEG3
020550  001401                                  BEQ     NEG3
020552  100404                                  BMI     NEG4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-=--
                                                                        ;           CONDITIONAL BRANCH INST. AND   <=  -
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <= -
                                                                        ;           WHICH FOLLOWS W/ 751           <  =
020554                                  NEG3:
020554  012742  000467                          MOV     #467,-(R2)      ;MOVE TO MAILBOX #  *******  467  *******
020560  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020562  000000                                  HALT                    ;NEG DID NOT SET CC'S CORRECTLY
020564  005000                          NEG4:   CLR     R0
020566  000277                                  SCC                     ;CC-1011
020570  000244                                  CLZ
020572  005400                                  NEG     R0              ;CC=0100   R0=0
020574  102403                                  BVS     NEG5
020576  103402                                  BCS     NEG5
020600  001001                                  BNE     NEG5
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020602  100004                          BPL     TS220
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 735           <---
020604                          NEG5:
020604  012742  000470                  MOV     #470,-(R2)      ;MOVE TO MAILBOX #  *******  470  *******
020610  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020612  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 220       TEST CMP INSTRUCTION
                                ;*******************************************************************
020614  005212                  TS220:  INC     (R2)            ;UPDATE TEST NUMBER
020616  022712  000220                  CMP     #220,(R2)       ;SEQUENCE ERROR?
020622  001060                          BNE     TS221-10        ;BR TO ERROR HALT ON SEQ ERROR
020624  012700  000005                  MOV     #5,R0
020630  000257                          CCC                     ;CC=1010
020632  000271                          +SEN.SEC
020634  022700  000005                  CMP     #5,R0           ;CC=0101
020640  101002                          BHI     CMP1
020642  102401                          BVS     CMP1
020644  100004                          BPL     CMP2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 766           <---
020646                          CMP1:
020646  012742  000471                  MOV     #471,-(R2)      ;MOVE TO MAILBOX #  *******  471  *******
020652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020654  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020656  012700  100000          CMP2:   MOV     #100000,R0
020662  000277                          SCC                     ;CC=1101
020664  000242                          CLV
020666  020027  077777                  CMP     R0,#77777       ;CC=0010
020672  101402                          BLOS    CMP3
020674  102001                          BVC     CMP3
020676  100004                          BPL     CMP4
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 751           <---
020700                          CMP3:
020700  012742  000472                  MOV     #472,-(R2)      ;MOVE TO MAILBOX #  *******  472  *******
020704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020706  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020710  052700  040000          CMP4:   BIS     #40000,R0       ;R0=140000
020714  000257                          CCC                     ;CC=0100
020716  000264                          SEZ
020720  022700  040000                  CMP     #40000,R0       ;CC=1011
020724  102003                          BVC     CMP5
020726  103002                          BCC     CMP5
020730  001401                          BEQ     CMP5
020732  100404                          BMI     CMP6
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
```

```
                                                                ;           CONDITIONAL BRANCH INST. AND   <---
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                ;           WHICH FOLLOWS W/ 733           <---
020734                          CMP5:
020734  012742  000473                  MOV     #473,-(R2)      ;MOVE TO MAILBOX #  *******  473  *******
020740  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020742  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020744  042700  040000          CMP6:   BIC     #40000,R0
020750  000277                          SCC                     ;CC=1111
020752  022700  177777                  CMP     #-1,R0          ;CC=0000
020756  101402                          BLOS    CMP7
020760  102401                          BVS     CMP7
020762  100004                          BPL     TS221
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;           CONDITIONAL BRANCH INST. AND   <--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 717           <--
020764                          CMP7:
020764  012742  000474                  MOV     #474,-(R2)      ;MOVE TO MAILBOX #  *******  474  *******
020770  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020772  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 221       TEST COM INSTRUCTION
                                ;******************************************************************************** * *  *******
020774  005212                  TS221:  INC     (R2)            ;UPDATE TEST NUMBER
020776  022712  000221                  CMP     #221,(R2)       ;SEQUENCE ERROR?
021002  001010                          BNE     TS222-10        ;BR TO ERROR HALT ON SEQ ERROR
021004  012700  177777                  MOV     #-1,R0
021010  000257                          CCC                     ;CC=1010
021012  000265                          +SEC!SEZ
021014  005100                          COM     R0              ;CC=0101
021016  101002                          BHI     COM1
021020  102401                          BVS     COM1
021022  100004                          BPL     TS222
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 767           <-
021024                          COM1:
021024  012742  000475                  MOV     #475,-(R2)      ;MOVE TO MAILBOX #  *******  475  *******
021030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021032  000000                          HALT                    ;COM DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
```

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                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT TWO TESTS VERIFY THE FUNCTIONING OF THE SUB
                                        ;AND SBC INSTRUCTIONS.  BOTH OF THESE INSTRUCTIONS HANDLE THE
                                        ;C AND V BITS IDENTICALLY.  THE PROCEDURE IS TO PRESET THE CONDITION
                                        ;CODES, EXECUTE THE INSTRUCTION WITH A PARTICULAR SET OF DATA, AND
                                        ;THEN CHECK THE RESULTS BY EXECUTING A SERIES OF CONDITIONAL
                                        ;BRANCHES.  THIS PROCEDURE IS REPEATED SEVERAL TIMES WITH DIFFERENT
                                        ;DATA PATTERNS TO PROVIDE EVERY COMBINATION OF THE C AND V BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 222       TEST SUB INSTRUCTION
                                        ;*******************************************************************************
021034  005212                          TS222:  INC     (R2)            ;UPDATE TEST NUMBER
021036  022712  000222                          CMP     #222,(R2)       ;SEQUENCE ERROR?
021042  001055                                  BNE     TS223-10        ;BR TO ERROR HALT ON SEQ ERROR
021044  012700  125252                          MOV     #125252,R0
021050  000257                                  CCC                     ;CC=1010
021052  000271                                  +SEN!SEC
021054  162700  125252                          SUB     #125252,R0      ;CC=0101   R0=0
021060  101002                                  BHI     SUB1
021062  102401                                  BVS     SUB1
021064  100004                                  BPL     SUB2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 766           <---
021066                                  SUB1:
021066  012742  000476                          MOV     #476,-(R2)      ;MOVE TO MAILBOX #  *******  476  *******
021072  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021074  000000                                  HALT                    ;SUB DID NOT SET CC'S CORRECTLY
021076  052700  100000                  SUB2:   BIS     #100000,R0
021102  000277                                  SCC                     ;CC=1101
021104  000242                                  CLV
021106  162700  077777                          SUB     #77777,R0       ;CC=0010   R0=1
021112  101402                                  BLOS    SUB3
021114  102001                                  BVC     SUB3
021116  100004                                  BPL     SUB4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-===
                                                                        ;           CONDITIONAL BRANCH INST. AND   <----
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-==
                                                                        ;           WHICH FOLLOWS W/ 751           <=---
021120                                  SUB3:
021120  012742  000477                          MOV     #477,-(R2)      ;MOVE TO MAILBOX #  *******  477  *******
021124  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021126  000000                                  HALT                    ;
021130  005100                          SUB4:   COM     R0              ;R0=177777
021132  000277                                  SCC                     ;CC=11111

021134  162700  100000                          SUB     #100000,R0      ;CC=0000   R0=77777
021140  101402                                  BLOS    SUB5
021142  102401                                  BVS     SUB5
021144  100004                                  BPL     SUB6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
```

```
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 736           <====
021146                          SUB5:
021146  012742  000500                  MOV     #500,-(R2)      ;MOVE TO MAILBOX #  *******  500  *******
021152  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021154  000000                          HALT                    ;SUB DID NOT SET CC'S CORRECTLY
021156  000257                  SUB6:   CCC                     ;CC=0100
021160  000264                          SEZ
021162  162700  140000                  SUB     #140000,R0      ;CC=1011
021166  102003                          BVC     SUB7
021170  103002                          BCC     SUB7
021172  001401                          BEQ     SUB7
021174  100404                          BMI     TS223
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 722           <====
021176                          SUB7:
021176  012742  000501                  MOV     #501,-(R2)      ;MOVE TO MAILBOX #  *******  501  *******
021202  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021204  000000                          HALT                    ;

                                ;*******************************************************************************
                                ;TEST 223       TEST SBC INSTRUCTION
                                ;*******************************************************************************
021206  005212                  TS223:  INC     (R2)            ;UPDATE TEST NUMBER
021210  022712  000223                  CMP     #223,(R2)       ;SEQUENCE ERROR?
021214  001053                          BNE     TS224-10        ;BR TO ERROR HALT ON SEQ ERROR
021216  012700  000001                  MOV     #1,R0
021222  000277                          SCC                     ;CC=1011
021224  000244                          CLZ
021226  005600                          SBC     R0              ;CC=0100   R-0
021230  103403                          BCS     SBC1
021232  102402                          BVS     SBC1
021234  100401                          BMI     SBC1
021236  001404                          BEQ     SBC2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                        ;           WHICH FOLLOWS W/ 766           <
021240                          SBC1:
021240  012742  000502                  MOV     #502,-(R2)      ;MOVE TO MAILBOX #  *******  502  *******
021244  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021246  000000                          HALT                    ;SBC DID NOT SET CC'S CORRECTLY
021250  000277                  SBC2:   SCC                     ;CC=1010
021252  000245                          +CLZ!CLC
021254  005600                          SBC     R0              ;CC=0100   R=0
021256  103403                          BCS     SBC3
021260  102402                          BVS     SBC3
021262  100401                          BMI     SBC3
021264  001404                          BEQ     SBC4
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 753           <
021266                          SBC3:
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021266  012742  000503                MOV     #503,-(R2)      ;MOVE TO MAILBOX #  *******  503  *******
021272  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021274  000000                        HALT                    ;SBC DID NOT SET CC'S CORRECTLY
021276  000277                SBC4:   SCC                     ;CC=0111
021300  000250                        CLN
021302  005600                        SBC     R0              ;CC=1001   R0=177777
021304  103003                        BCC     SBC5
021306  102402                        BVS     SBC5
021310  001401                        BEQ     SBC5
021312  100404                        BMI     SBC6
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                              ;           CONDITIONAL BRANCH INST. AND   <=-
                                                              ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                              ;           WHICH FOLLOWS W/ 740           <=-
021314                        SBC5:
021314  012742  000504                MOV     #504,-(R2)      ;MOVE TO MAILBOX #  *******  504  *******
021320  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021322  000000                        HALT                    ;SBC DID NOT SET CC'S CORRECTLY
021324  042700  077777        SBC6:   BIC     #77777,R0       ;R0=100000
021330  000277                        SCC                     ;CC=1101
021332  000242                        CLV
021334  005600                        SBC     R0              ;CC=0010
021336  101402                        BLOS    SBC7
021340  102001                        BVC     SBC7
021342  100004                        BPL     TS224
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                              ;           CONDITIONAL BRANCH INST. AND   <=-
                                                              ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                              ;           WHICH FOLLOWS W/ 724           <=-
021344                        SBC7:
021344  012742  000505                MOV     #505,-(R2)      ;MOVE TO MAILBOX #  *******  505  *******
021350  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021352  000000                        HALT                    ;SBC DID NOT SET CC'S CORRECTLY
                                                              ;  OR SEQUENCE ERROR
```

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                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT FOUR TESTS VERIFY THE FUNCTIONING OF THE ROL,
                                        ;ROR, ASL AND ASR INSTRUCTIONS.  SPECIAL DATA PATTERNS ARE LOADED
                                        ;AND ROTATED SEVERAL TIMES FOR EACH TEST.  THE CONDITION CODES
                                        ;ARE PRESET BEFORE EACH ROTATION AND THE CONDITION CODES ARE
                                        ;CHECKED AFTER EACH ROTATION.  THE FINAL CHECK IN EACH TEST IS
                                        ;TO VERIFY THE COMMULATIVE DATA RESULT.  THE DATA PATTERNS HAVE
                                        ;BEEN SELECTED TO PRODUCE ALL COMBINATIONS OF THE C AND V BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 224       TEST ROL INSTRUCTION
                                        ;*******************************************************************************
021354  005212                          TS224:  INC     (R2)            ;UPDATE TEST NUMBER
021356  022712  000224                          CMP     #224,(R2)       ;SEQUENCE ERROR?
021362  001053                                  BNE     TS225-10        ;BR TO ERROR HALT ON SEQ ERROR
021364  012700  144000                          MOV     #144000,R0      ;R0=144000
021370  000257                                  CCC                     ;CC=0110
021372  000266                                  +SEZ.SEV
021374  006100                                  ROL     R0              ;CC=1001   R0=110000
021376  103003                                  BCC     ROL1
021400  102402                                  BVS     ROL1
021402  001401                                  BEQ     ROL1
021404  100404                                  BMI     ROL2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---
                                                                        ;           CONDITIONAL BRANCH INST. AND    <=--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                        ;           WHICH FOLLOWS W/ 766            <---
021406                                  ROL1:
021406  012742  000506                          MOV     #506,-(R2)      ;MOVE TO MAILBOX #  *******  506  *******
021412  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021414  000000                                  HALT                    ;
021416  000277                          ROL2:   SCC                     ;CC=1100
021420  000243                                  +CLV!CLC
021422  006100                                  ROL     R0              ;CC=0011   R0=020000
021424  103003                                  BCC     ROL3
021426  102002                                  BVC     ROL3
021430  001401                                  BEQ     ROL3
021432  100004                                  BPL     ROL4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <=--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                        ;           WHICH FOLLOWS W/ 753            <=---
021434                                  ROL3:
021434  012742  000507                          MOV     #507,-(R2)      ;MOVE TO MAILBOX #  *******  507  *******
021440  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021442  000000                                  HALT                    ;ROL DID NOT SET CC'S CORRECTLY
021444  000277                          ROL4:   SCC                     ;CC=0111
021446  000250                                  CLN
021450  006100                                  ROL     R0              ;CC=0000   R0=040001
021452  101402                                  BLOS    ROL5
021454  102401                                  BVS     ROL5
021456  100004                                  BPL     ROL6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---
                                                                        ;           CONDITIONAL BRANCH INST. AND    <=--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <--
```

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                                                        ;            WHICH FOLLOWS W/ 741
021460                          ROL5:
021460  012742  000510                  MOV     #510,-(R2)      ;MOVE TO MAILBOX #  *******  510  *******
021464  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021466  000000                          HALT                    ;ROL DID NOT SET CC'S CORRECTLY
021470  000257                  ROL6:   CCC                     ;CC=0101
021472  000265                          +SEZ.SEC
021474  006100                          ROL     R0              ;CC=1010   R0=100003
021476  101405                          BLOS    ROL7
021500  102004                          BVC     ROL7
021502  100003                          BPL     ROL7
021504  022700  100003                  CMP     #100003,R0
021510  001404                          BEQ     TS225
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 724           <---
021512                          ROL7:
021512  012742  000511                  MOV     #511,-(R2)      ;MOVE TO MAILBOX #  *******  511  *******
021516  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021520  000000                          HALT                    ;ROL MALFUNCTIONED
                                                        ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 225       TEST ROR INSTRUCTION
                                ;*******************************************************************
021522  005212                  TS225:  INC     (R2)            ;UPDATE TEST NUMBER
021524  022712  000225                  CMP     #225,(R2)       ;SEQUENCE ERROR?
021530  001051                          BNE     TS226-10        ;BR TO ERROR HALT ON SEQ ERROR
021532  012700  000023                  MOV     #23,R0          ;R0=23
021536  000277                          SCC                     ;CC=0111
021540  000250                          CLN
021542  006000                          ROR     R0              ;CC=1001   R0=100011
021544  102403                          BVS     ROR1
021546  103002                          BCC     ROR1
021550  001401                          BEQ     ROR1
021552  100404                          BMI     ROR2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 766           <---
021554                          ROR1:
021554  012742  000512                  MOV     #512,-(R2)      ;MOVE TO MAILBOX #  *******  512  *******
021560  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021562  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021564  000257                  ROR2:   CCC                     ;CC=1100
021566  000274                          +SEN!SEZ
021570  006000                          ROR     R0              ;CC=0011   R0=040004
021572  102003                          BVC     ROR3
021574  103002                          BCC     ROR3
021576  001401                          BEQ     ROR3
021600  100004                          BPL     ROR4
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                        ;           WHICH FOLLOWS W/ 753           <---
[illegible]                     ROR3:
```

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021602  012742  000513                  MOV     #513,-(R2)      ;MOVE TO MAILBOX #  *******  513  *******
021606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021610  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021612  000277                  ROR4:   SCC                     ;CC=1110
021614  000241                          CLC
021616  006000                          ROR     R0              ;CC=0000   R0=020002
021620  101403                          BLOS    ROR5
021622  102402                          BVS     ROR5
021624  001401                          BEQ     ROR5
021626  100004                          BPL     ROR6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 740           <
021630                          ROR5:
021630  012742  000514                  MOV     #514,-(R2)      ;MOVE TO MAILBOX #  *******  514  *******
021634  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021636  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021640  000257                  ROR6:   CCC                     ;CC=0101
021642  000265                          +SEC.SEZ
021644  006000                          ROR     R0              ;CC=1010   R0=110001
021646  101402                          BLOS    ROR7
021650  102001                          BVC     ROR7
021652  100404                          BMI     TS226
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 726           <-
021654                          ROR7:
021654  012742  000515                  MOV     #515,-(R2)      ;MOVE TO MAILBOX #  *******  515  *******
021660  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021662  000000                          HALT                    ;ROR DID NOT PRODUCE CORRECT RESULTS
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 226       TEST ASL INSTRUCTION
                                ;*******************************************************************
021664  005212                  TS226:  INC     (R2)            ;UPDATE TEST NUMBER
021666  022712  000226                  CMP     #226,(R2)       ;SEQUENCE ERROR?
021672  001054                          BNE     TS227-10        ;BR TO ERROR HALT ON SEQ ERROR
021674  012700  144000                  MOV     #144000,R0      ;R0=14000
021700  000257                          CCC                     ;CC=0110
021702  000271                          +SEN!SEC
021704  006300                          ASL     R0              ;CC=1001   R0-110000
021706  103003                          BCC     ASL1
021710  102402                          BVS     ASL1
021712  001401                          BEQ     ASL1
021714  100404                          BMI     ASL2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <
021716                          ASL1:
021716  012742  000516                  MOV     #516,-(R2)      ;MOVE TO MAILBOX #  *******  516  *******
021722  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021724  000000                          HALT                    ;
021726  000277                  ASL2:   SCC                     ;CC 1100
```

```
021730  000243                          +CLV.CLC
021732  006300                          ASL     R0              ;CC=0011   R0=020000
021734  103003                          BCC     ASL3
021736  102002                          BVC     ASL3
021740  001401                          BEQ     ASL3
021742  100004                          BPL     ASL4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 753           <====
021744                          ASL3:
021744  012742  000517                  MOV     #517,-(R2)      ;MOVE TO MAILBOX #  *******  517  *******
021750  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021752  000000                          HALT                    ;ASL DID NOT SET CC'S CORRECTLY
021754  000277                  ASL4:   SCC                     ;CC=0111
021756  000250                          CLN
021760  006300                          ASL     R0              ;CC=0000   R0=040000
021762  101402                          BLOS    ASL5
021764  102401                          BVS     ASL5
021766  100004                          BPL     ASL6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 741           <====
021770                          ASL5:
021770  012742  000520                  MOV     #520,-(R2)      ;MOVE TO MAILBOX #  *******  520  *******
021774  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021776  000000                          HALT                    ;ASL DID NOT SET CC'S CORRECTLY
022000  000257                  ASL6:   CCC                     ;CC=0101
022002  000265                          +SEZ!SEC
022004  006300                          ASL     R0              ;CC=1010   R0=100000
022006  103406                          BCS     ASL7
022010  001405                          BEQ     ASL7
022012  102004                          BVC     ASL7
022014  100003                          BPL     ASL7
022016  022700  100000                  CMP     #100000,R0
022022  001404                          BEQ     TS227
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=
                                                                ;           WHICH FOLLOWS W/ 723           <=
022024                          ASL7:
022024  012742  000521                  MOV     #521,-(R2)      ;MOVE TO MAILBOX #  *******  521  *******
022030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022032  000000                          HALT                    ;ASL MALFUNCTIONED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;TEST 227       TEST ASR INSTRUCTION
                                        ;*******************************************************************************
022034  005212                          TS227:  INC     (R2)            ;UPDATE TEST NUMBER
022036  022712  000227                          CMP     #227,(R2)       ;SEQUENCE ERROR?
022042  001060                                  BNE     TS230-10        ;BR TO ERROR HALT ON SEQ ERROR
022044  012700  100023                          MOV     #100023,R0      ;R0=100023
022050  000277                                  SCC                     ;CC=0110
022052  000250                                  CLN
022054  006200                                  ASR     R0              ;CC=1001   RP-140011
022056  102403                                  BVS     ASR1
022060  103002                                  BCC     ASR1
022062  001401                                  BEQ     ASR1
022064  100404                                  BMI     ASR2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
022066                                  ASR1:
022066  012742  000522                          MOV     #522,-(R2)      ;MOVE TO MAILBOX #  *******  522  *******
022072  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022074  000000                                  HALT                    ;ASR DID NOT SET CC'S CORRECTLY
022076  042700  100000                  ASR2:   BIC     #100000,R0      ;R0=40011
022102  000277                                  SCC                     ;CC=1100
022104  000243                                  +CLV!CLC
022106  006200                                  ASR     R0              ;CC=0011   R0=020004
022110  102003                                  BVC     ASR3
022112  103002                                  BCC     ASR3
022114  001401                                  BEQ     ASR3
022116  100004                                  BPL     ASR4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                        ;           CONDITIONAL BRANCH INST. AND   <--
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <=
                                                                        ;           WHICH FOLLOWS W/ 751           <--
022120                                  ASR3:
022120  012742  000523                          MOV     #523,-(R2)      ;MOVE TO MAILBOX #  *******  523  *******
022124  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022126  000000                                  HALT                    ;ASR DID NOT SET CC'S CORRECTLY
022130  000277                          ASR4:   SCC                     ;CC=1111

022132  006200                                  ASR     R0              ;CC=0000   R0=010002
022134  101403                                  BLOS    ASR5
022136  102402                                  BVS     ASR5
022140  001401                                  BEQ     ASR5
022142  100004                                  BPL     ASR6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                                        ;           WHICH FOLLOWS W/ 737           <
022144                                  ASR5:
022144  012742  000524                          MOV     #524,-(R2)      ;MOVE TO MAILBOX #  *******  524  *******
022150  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022152  000000                                  HALT                    ;ASR DID NOT SET CC'S CORRECTLY
022154  052700  100000                  ASR6:   BIS     #100000,R0      ;R0=110002
022160  000257                                  CCC                     ;CC-0101
022162  000265                                  +SEZ.SEC
```

```
022164  006200                          ASR     R0              ;C=1010   R0=144001
022166  101406                          BLOS    ASR7
022170  102005                          BVC     ASR7
022172  100004                          BPL     ASR7
022174  001403                          BEQ     ASR7
022176  022700  144001                  CMP     #144001,R0      ;CHECK RESULT OF ASR'S
022202  001404                          BEQ     TS230
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 717            <====
022204                          ASR7:
022204  012742  000525                  MOV     #525,-(R2)      ;MOVE TO MAILBOX #  *******  525  *******
022210  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022212  000000                          HALT                    ;ASR DID NOT FUNCTION CORRECTLY
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE SXT INSTRUCTION. CONDITION CODES
                                ;ARE PRESET IN EACH OF THE TWO POSSIBLE CASES. WITH THE N-BIT SET,
                                ;THE TEST CHECKS FOR ALL ONES IN THE DESTINATION. WITH THE N-BIT
                                ;CLEAR, THE DESTINATION SHOULD CONTAIN ALL ZEROES. THE DATA
                                ;IS VERIFIED BY CONDITIONAL BRANCHES.
                                ;
                                ;*******************************************************************************
                                ;TEST 230       TEST THE SXT INSTRUCTION
                                ;*******************************************************************************
022214  005212                  TS230:  INC     (R2)            ;UPDATE TEST NUMBER
022216  022712  000230                  CMP     #230,(R2)       ;SEQUENCE ERROR?
022222  001033                          BNE     TS231-10        ;BR TO ERROR HALT ON SEQ ERROR
022224  005000                          CLR     R0
022226  000277                          SCC                     ;SET CC=1011
022230  000244                          CLZ
022232  006700                          SXT     R0              ;TRY SXT
022234  100006                          BPL     SXT0            ;TEST CC=1001
022236  001405                          BEQ     SXT0
022240  102404                          BVS     SXT0
022242  103003                          BCC     SXT0
022244  022700  177777                  CMP     #-1,R0          ;CHECK DATA RESULT
022250  001404                          BEQ     SXT1
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 764            <====
022252                          SXT0:
022252  012742  000526                  MOV     #526,-(R2)      ;MOVE TO MAILBOX #  *******  526  *******
022256  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022260  000000                          HALT                    ;RESULTS OF SXT INCORRECT
022262  005000                  SXT1:   CLR     R0              ;R0=0
022264  005010                          CLR     (R0)            ;LOC. 0=0
022266  005110                          COM     (R0)            ;LOC. 0=177777
022270  000257                          CCC                     ;SET CC=0110
022272  000266                          +SEZ.SEV
```

```
022274  006710                          SXT     (R0)
022276  001005                          BNE     SXT2            ;TEST CC=0100
022300  103404                          BCS     SXT2
022302  102403                          BVS     SXT2
022304  100402                          BMI     SXT2
022306  005710                          TST     (R0)
022310  001404                          BEQ     TS231
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 744            <====
022312                          SXT2:
022312  012742  000527                  MOV     #527,-(R2)      ;MOVE TO MAILBOX #  *******  527  *******
022316  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022320  000000                          HALT                    ;RESULTS OF SXT INCORRECT
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE XOR INSTRUCTION. UNIQUE PATTERNS
                                        ;OF ONES AND ZEROES ARE MOVED TO DATA REGISTERS R0 AND R1.
                                        ;AFTER THE FIRST XOR INSTRUCTION R0=36146. AN XOR IS THEN
                                        ;EXECUTED WITH THIS NEW VALUE AND THE CONTENTS OF R1 TO
                                        ;REPRODUCE THE ORIGINAL VALUE IF R0=31525.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 231       TEST THE XOR INSTRUCTION
                                        ;*******************************************************************************
022322  005212                          TS231:  INC     (R2)            ;UPDATE TEST NUMBER
022324  022712  000231                          CMP     #231,(R2)       ;SEQUENCE ERROR?
022330  001035                                  BNE     TS232-10        ;BR TO ERROR HALT ON SEQ ERROR
022332  012700  007463                          MOV     #7463,R0        ;SET UP R0
022336  012701  031525                          MOV     #31525,R1       ;SET UP R1
022342  000277                                  SCC                     ;SET CC=1110
022344  000241                                  CLC
022346  074100                                  XOR     R1,R0           ;TRY XOR
022350  101406                                  BLOS    XOR1            ;CC=0000?
022352  102405                                  BVS     XOR1
022354  001404                                  BEQ     XOR1
022356  100403                                  BMI     XOR1
022360  022700  036146                          CMP     #36146,R0       ;DATA RESULT CORRECT?
022364  001404                                  BEQ     XOR2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 761            <-
022366                                  XOR1:
022366  012742  000530                          MOV     #530,-(R2)      ;MOVE TO MAILBOX #  *******  530  *******
022372  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022374  000000                                  HALT                    ;
022376  010104                          XOR2:   MOV     R1,R4
022400  000261                                  SEC                     ;CC=1110
022402  000241                                  CLC
022404  074400                                  XOR     R4,R0           ;TRY XOR MODE 0,0
022406  101406                                  BLOS    XOR3            ;CC-0000?
022410  102405                                  BVS     XOR3
022412  001404                                  BEQ     XOR3
022414  100403                                  BMI     XOR3
022416  022700  007463                          CMP     #7463,R0
022422  001404                                  BEQ     TS232
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==-
                                                                        ;           WHICH FOLLOWS W/ 742            <--=
022424                                  XOR3:
022424  012742  000531                          MOV     #531,-(R2)      ;MOVE TO MAILBOX #  *******  531  *******
022430  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022432  000000                                  HALT                    ;RESULT OF XOR INCORRECT
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE SOB INSTRUCTION. R4 IS USED AS A
                                        ;COUNTER WHILE R0 IS THE ADDRESS REGISTER. CONDITIONAL
                                        ;BRANCHES ARE USED TO VERIFY PROPER TRANSFER OF CONTROL
                                        ;WHILE R4 IS CHECKED TO INSURE PROPER DECREMENTING OF R0.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 232       TEST SOB INSTRUCTION
                                        ;*******************************************************************************
022434  005212                          TS232:  INC     (R2)            ;UPDATE TEST NUMBER
022436  022712  000232                          CMP     #232,(R2)       ;SEQUENCE ERROR?
022442  001023                                  BNE     TS233-10        ;BR TO ERROR HALT ON SEQ ERROR
022444  012700  000525                          MOV     #525,R0
022450  010004                                  MOV     R0,R4
022452  000277                                  SCC                     ;SET CC-1111
022454  101002                          SOB1:   BHI     SOB2            ;CC=1111?
022456  100001                                  BPL     SOB2
022460  102404                                  BVS     SOB3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <--
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                        ;           WHICH FOLLOWS W/ 770            <--
022462                                  SOB2:
022462  012742  000532                          MOV     #532,-(R2)      ;MOVE TO MAILBOX #  *******  532  *******
022466  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022470  000000                                  HALT                    ;
022472  005304                          SOB3:   DEC     R4              ;COUNT ITERATIONS
022474  000277                                  SCC                     ;CC=1111
022476  077012                                  SOB     R0,SOB1         ;DO SOB W/ R0
022500  101004                                  BHI     SOB4            ;CHECK CC=1111
022502  100003                                  BPL     SOB4
022504  102002                                  BVC     SOB4
022506  005704                                  TST     R4              ;ITERATION COUNT OK?
022510  001404                                  BEQ     TS233
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <== =
                                                                        ;           CONDITIONAL BRANCH INST. AND    <== =
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <== =
                                                                        ;           WHICH FOLLOWS W/ 754            <==
022512                                  SOB4:
022512  012742  000533                          MOV     #533,-(R2)      ;MOVE TO MAILBOX #  *******  533  *******
022516  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022520  000000                                  HALT                    ;INCORRECT # OF BRANCHES OR CC'S CHANGED
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE MARK INSTRUCTION. THE EFFECTS
                                        ;OF THE MARK INSTRUCTION ARE SIMULATED BY THE PROGRAM INSTRUCTIONS.
                                        ;THE CONTENTS OF R5 AND THE STACK POINTER ARE CHECKED AFTER EACH
                                        ;OF THE TWO ROUTINES IN THE TEST.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 233       TEST MARK INSTRUCTION
                                        ;*******************************************************************************
022522  005212                          TS233:  INC     (R2) +          ;UPDATE TEST NUMBER
022524  022712  000233                          CMP     #233,(R2)       ;SEQUENCE ERROR?
022530  001061                                  BNE     TS234-10        ;BR TO ERROR HALT ON SEQ ERROR
022532  012706  001000                          MOV     #STBOT,SP
022536  012746  125252                          MOV     #125252,-(SP)   ;PUT R5 VALUE ON STACK
022542  162706  000074                          SUB     #74,SP          ;EFFECTIVELY PUT 36 ARGUMENTS ON STACK
022546  012705  022572                          MOV     #MRK1,R5        ;SET NEW PC IN R5
022552  012746  006436                          MOV     #6436,-(SP)     ;PUT MARK 36 INST. ON STACK
022556  000277                                  SCC                     ;SET CC=1111
022560  000116                                  JMP     (SP)            ;XFER CONTL TO MARK 36 INST. ON STACK
022562  012742  000534                          MOV     #534,-(R2)      ;MOVE TO MAILBOX #  *******  534  *******
022566  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022570  000000                                  HALT                    ;MARK INST. SHOULD HAVE JUMPED TO MRK1
022572  101010                          MRK1:   BHI     MRK2            ;TEST CC UNAFFECTED
022574  100007                                  BPL     MRK2            ;IE. CC=1111
022576  102006                                  BVC     MRK2
022600  020527  125252                          CMP     R5,#125252      ;CHECK R5 RESTORED FROM STACK
022604  001003                                  BNE     MRK2
022606  022706  001000                          CMP     #STBOT,R6       ;CHECK STACK POINTER READJUSTED CORRECTLY.
022612  001404                                  BEQ     MRK3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 746           <
022614                                  MRK2:
022614  012742  000535                          MOV     #535,-(R2)      ;MOVE TO MAILBOX #  *******  535  *******
022620  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022622  000000                                  HALT                    ;RESULTS OF MARK INCORRECT
022624  012746  052525                  MRK3:   MOV     #52525,-(SP)
022630  012746  006400                          MOV     #6400,-(SP)     ;PUT MARK 0 INST. ON STACK
022634  010605                                  MOV     SP,R5           ;SET ADDR. OF MARK INST. IN R5
022636  004737  022646                          JSR     PC,@#MRK4       ;DO JSR
022642  000137  022660                          JMP     @#MRK5          ;
022646  000205                          MRK4:   RTS     R5              ;DO RTS WITH R5 TO MARK INST ON STACK
022650  012742  000536                          MOV     #536,-(R2)      ;MOVE TO MAILBOX #  *******  536  *******
022654  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022656  000000                                  HALT                    ;RTS,MARK SEQUENCE FAILED
022660  022706  001000                  MRK5:   CMP     #STBOT,R6       ;STACK ADJUSTED CORRECTLY
022664  001003                                  BNE     MRK6            ;IF NOT:  BR
022666  022705  052525                          CMP     #52525,R5       ;CHECK IF R5 RESTORED FROM STACK
022672  001404                                  BEQ     TS234
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 716           <
022674                                  MRK6:
```

```
022674  012742  000537          MOV     #537,-(R2)      ;MOVE TO MAILBOX #  *******  537  *******
022700  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022702  000000                  HALT                    ;RESULTS OF MARK INCORRECT
                                                        ;  OR SEQUENCE ERROR
```

```
                177776                          PS=177776
                                        ;*******************************************************************
                                        ;
                                        ;       THESE NEXT SEVEN TESTS VERIFY THE MTPS INSTRUCTION IN ALL
                                        ;       MODES. THE PSW IS DEFINED BY AN EQUATE STATEMENT BEFORE THE
                                        ;       FIRST MTPS TEST. IN EACH TEST A PATTERN OF ONES AND
                                        ;       ZEROES IS SET IN A DATA REGISTER AND MOVED TO THE PSW.
                                        ;       THE DATA IN THE PSW, AND THE DATA REGISTER ADDRESS,
                                        ;       ARE CHECKED TO VERIFY PROPER EXECUTION OF THE INSTRUCTION.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 234       TEST MTPS INSTRUCTION
                                        ;*******************************************************************
022704  005212                          TS234:  INC     (R2)            ;UPDATE TEST NUMBER
022706  022712  000234                          CMP     #234,(R2)       ;SEQUENCE ERROR?
022712  001024                                  BNE     TS235-10        ;BR TO ERROR HALT ON SEQ ERROR
022714  012700  000377                          MOV     #377,R0
022720  000257                                  CCC
022722  106400                                  MTPS    R0
022724  022767  000357  155044                  CMP     #357,PS
022732  001404                                  BEQ     MTPS1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 767           <-
022734  012742  000540                          MOV     #540,-(R2)      ;MOVE TO MAILBOX #  *******  540  *******
022740  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022742  000000                                  HALT                    ;MTPS FAILED
022744  005000                          MTPS1:  CLR     R0
022746  005010                                  CLR     (R0)
022750  000277                                  SCC                     ;CC=1111
022752  106410                                  MTPS    (R0)            ;TRY MTPS MODE 1
022754  100403                                  BMI     MTPS1A          ;CHECK PS
022756  102402                                  BVS     MTPS1A
022760  103401                                  BCS     MTPS1A
022762  001004                                  BNE     TS235
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 753           <-
022764                                  MTPS1A:
022764  012742  000541                          MOV     #541,-(R2)      ;MOVE TO MAILBOX #  *******  541  *******
022770  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022772  000000                                  HALT                    ;MTPS FAILED
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************
                                        ;TEST 235       TEST MTPS MODE 2
                                        ;*******************************************************************
022774  005212                          TS235:  INC     (R2)            ;UPDATE TEST NUMBER
022776  022712  000235                          CMP     #235,(R2)       ;SEQUENCE ERROR?
023002  001021                                  BNE     TS236-10        ;BR TO ERROR HALT ON SEQ ERROR
023004  005000                                  CLR     R0              ;R0=0
023006  012710  177777                          MOV     #-1,(R0)        ;LOC. 0=-1
023012  005037  177776                          CLR     @#PS            ;PS=0
023016  106420                                  MTPS    (R0)+           ;TRY MTPS W/MODE 2
```

```
023020  022737  000357  177776          CMP     #357,@#PS       ;CHECK DATA
023026  001404                          BEQ     MTPS2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 765
023030  012742  000542                  MOV     #542,-(R2)      ;MOVE TO MAILBOX #  *******  542  *******
023034  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023036  000000                          HALT                    ;DEST. DATA INCORRECT
023040  022700  000001          MTPS2:  CMP     #1,R0           ;CHECK DEST. REGISTER.
023044  001404                          BEQ     TS236
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 756            <====
023046  012742  000543                  MOV     #543,-(R2)      ;MOVE TO MAILBOX #  *******  543  *******
023052  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023054  000000                          HALT                    ;DEST REGISTER NOT INCREMENTED BY 1
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 236       TEST MTPS MODE 3
                                ;*******************************************************************************
023056  005212                  TS236:  INC     (R2)            ;UPDATE TEST NUMBER
023060  022712  000236                  CMP     #236,(R2)       ;SEQUENCE ERROR?
023064  001024                          BNE     TS237-10        ;BR TO ERROR HALT ON SEQ ERROR
023066  012700  000402                  MOV     #402,R0         ;R0=402
023072  005010                          CLR     (R0)            ;LOC. 402=0
023074  012737  052652  000000          MOV     #52652,@#0      ;LOC. 0=52652
023102  005037  177776                  CLR     @#PS            ;PS=0
023106  106430                          MTPS    @(R0)+          ;TRY MTPS W/MODE 3
023110  022737  000252  177776          CMP     #252,@#PS       ;CHECK DEST. DATA
023116  001404                          BEQ     MTPS3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 762
023120  012742  000544                  MOV     #544,-(R2)      ;MOVE TO MAILBOX #  *******  544  *******
023124  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023126  000000                          HALT                    ;DEST. DATA INCORRECT
023130  022700  000404          MTPS3:  CMP     #404,R0         ;CHECK MODE 3 REGISTER.
023134  001404                          BEQ     TS237
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 753
023136  012742  000545                  MOV     #545,-(R2)      ;MOVE TO MAILBOX #  *******  545  *******
023142  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023144  000000                          HALT                    ;MODE 3 REGISTER INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 237       TEST MTPS MODE 4
                                ;*******************************************************************************
023146  005212                  TS237:  INC     (R2)            ;UPDATE TEST NUMBER
023150  022712  000237                  CMP     #237,(R2)       ;SEQUENCE ERROR?
```

```
023154  001022                          BNE     TS240-10        ;BR TO ERROR HALT ON SEQ ERROR
023156  012700  000001                  MOV     #1,R0           ;R0=1
023162  012737  125125  000000          MOV     #125125,@#0     ;LOC. 0 = 125125
023170  005037  177776                  CLR     @#PS            ;PS=0
023174  106440                          MTPS    -(R0)           ;TRY MTPS W/MODE 4
023176  022737  000105  177776          CMP     #105,@#PS       ;CHECK DEST. DATA
023204  001404                          BEQ     MTPS4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 763           <====
023206  012742  000546                  MOV     #546,-(R2)      ;MOVE TO MAILBOX #  *******  546  *******
023212  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023214  000000                          HALT                    ;DEST. DATA INCORRECT
023216  005700                  MTPS4:  TST     R0              ;CHECK MODE 4 REGISTER
023220  001404                          BEQ     TS240
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 755           <====
023222  012742  000547                  MOV     #547,-(R2)      ;MOVE TO MAILBOX #  *******  547  *******
023226  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023230  000000                          HALT                    ;MODE 4 REGISTER NOT DECREMENTED BY 1
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
                                ;TEST 240       TEST MTPS MODE 5
                                ;*******************************************************************
023232  005212                  TS240:  INC     (R2)            ;UPDATE TEST NUMBER
023234  022712  000240                  CMP     #240,(R2)       ;SEQUENCE ERROR?
023240  001021                          BNE     TS241-10        ;BR TO ERROR HALT ON SEQ ERROR
023242  012700  000404                  MOV     #404,R0         ;R0=404
023246  012737  177400  000000          MOV     #177400,@#0     ;LOC. 0=177400
023254  000277                          SCC                     ;SET ALL COND. CODES
023256  106450                          MTPS    @-(R0)          ;TRY MTPS W/MODE 5
023260  005737  177776                  TST     @#PS            ;CHECK DEST. DATA.
023264  001404                          BEQ     MTPS5
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 765           <
023266  012742  000550                  MOV     #550,-(R2)      ;MOVE TO MAILBOX #  *******  550  *******
023272  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023274  000000                          HALT                    ;DESTINATION DATA INCORRECT
023276  022700  000402          MTPS5:  CMP     #402,R0         ;CHECK MODE 5 REGISTER
023302  001404                          BEQ     TS241
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <==
                                                                ;           CONDITIONAL BRANCH INST. AND   <==
                                                                ;           REPLACE THE MOVE INSTRUCTION   <==
                                                                ;           WHICH FOLLOWS W/ 756           <
023304  012742  000551                  MOV     #551,-(R2)      ;MOVE TO MAILBOX #  *******  551  *******
023310  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023312  000000                          HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************
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                                        ;TEST 241       TEST MTPS MODE 6
                                        ;*******************************************************************************
023314  005212                          TS241:  INC     (R2)            ;UPDATE TEST NUMBER
023316  022712  000241                          CMP     #241,(R2)       ;SEQUENCE ERROR?
023322  001024                                  BNE     TS242-10        ;BR TO ERROR HALT ON SEQ ERROR
023324  012737  052652  000000                  MOV     #52652,@#0      ;LOC. 0=52652
023332  012700  000406                          MOV     #406,R0         ;R0=406
023336  005037  177776                          CLR     @#PS            ;PS=0
023342  106460  177372                          MTPS    -406(R0)        ;TRY MTPS W/MODE 6
023346  022737  000252  177776                  CMP     #252,@#PS       ;CHECK DEST. DATA
023354  001404                                  BEQ     MTPS6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==
                                                                        ;           WHICH FOLLOWS W/ 762            <==
023356  012742  000552                          MOV     #552,-(R2)      ;MOVE TO MAILBOX #  *******  552  *******
023362  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023364  000000                                  HALT                    ;DEST. DATA INCORRECT
023366  022700  000406                  MTPS6:  CMP     #406,R0         ;CHECK MODE 6 REGISTER
023372  001404                                  BEQ     TS242
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 753            <====
023374  012742  000553                          MOV     #553,-(R2)      ;MOVE TO MAILBOX #  *******  553  *******
023400  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023402  000000                                  HALT                    ;MODE 6 REGISTER MODIFIED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 242       TEST MTPS MODE 7
                                        ;*******************************************************************************
023404  005212                          TS242:  INC     (R2)            ;UPDATE TEST NUMBER
023406  022712  000242                          CMP     #242,(R2)       ;SEQUENCE ERROR?
023412  001024                                  BNE     TS243-10        ;BR TO ERROR HALT ON SEQ ERROR
023414  012737  052652  000000                  MOV     #52652,@#0      ;LOC. 0=52652
023422  012700  000410                          MOV     #410,R0         ;R0=410
023426  005037  177776                          CLR     @#PS            ;PS=0
023432  106470  177776                          MTPS    @-2(R0)         ;TRY MTPS W/MODE 7
023436  022737  000105  177776                  CMP     #105,@#PS       ;CHECK DEST. DATA
023444  001404                                  BEQ     MTPS7
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==
                                                                        ;           WHICH FOLLOWS W/ 762            <==
023446  012742  000554                          MOV     #554,-(R2)      ;MOVE TO MAILBOX #  *******  554  *******
023452  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023454  000000                                  HALT                    ;DESTINATION DATA INCORRECT
023456  022700  000410                  MTPS7:  CMP     #410,R0         ;CHECK MODE 7 REGISTER
023462  001404                                  BEQ     TS243
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==
                                                                        ;           WHICH FOLLOWS W/ 753            <==
023464  012742  000555                          MOV     #555,-(R2)      ;MOVE TO MAILBOX #  *******  555  *******
023470  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

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023472  000000                    HALT                    ;MODE 7 REGISTER MODIFIED
                                                          ;  OR SEQUENCE ERROR
```

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                                        ;*******************************************************************************
                                        ;
                                        ;       THESE NEXT SEVEN TESTS VERIFY THE MFPS INSTRUCTION IN ALL
                                        ;MODES. IN EACH TEST, A PATTERN OF ONES AND ZEROES IS MOVED TO THE
                                        ;PSW, AND AN MFPS INSTRUCTION MOVES THE DATA TO A LOCATION SETUP
                                        ;BY R0, EITHER DIRECTLY OR INDIRECTLY. CONDITIONAL BRANCHES ARE
                                        ;USED TO CHECK PROPER ADDRESSING AND DATA.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 243       TEST MFPS INSTRUCTION
                                        ;*******************************************************************************
023474  005212                          TS243:  INC     (R2)            ;UPDATE TEST NUMBER
023476  022712  000243                          CMP     #243,(R2)       ;SEQUENCE ERROR?
023502  001025                                  BNE     TS244-10        ;BR TO ERROR HALT ON SEQ ERROR
023504  012737  000377  177776                  MOV     #377,@#PS
023512  106700                                  MFPS    R0
023514  022700  177757                          CMP     #177757,R0
023520  001404                                  BEQ     MFPS1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-===
                                                                        ;           CONDITIONAL BRANCH INST. AND    <===-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==-=
                                                                        ;           WHICH FOLLOWS W/ 770            <=-=-
023522  012742  000556                          MOV     #556,-(R2)      ;MOVE TO MAILBOX #  *******  556  *******
023526  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023530  000000                                  HALT                    ;MFPS FAILED

023532  005000                          MFPS1:  CLR     R0
023534  012737  177777  000000                  MOV     #-1,@#0
023542  005037  177776                          CLR     @#PS
023546  106710                                  MFPS    (R0)
023550  105737  000000                          TSTB    @#0
023554  001404                                  BEQ     TS244
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-=-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <--=-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-=
                                                                        ;           WHICH FOLLOWS W/ 752            <-=-
023556  012742  000557                          MOV     #557,-(R2)      ;MOVE TO MAILBOX #  *******  557  *******
023562  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023564  000000                                  HALT                    ;MFPS FAILED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 244       TEST MFPS MODE 2
                                        ;*******************************************************************************
023566  005212                          TS244:  INC     (R2)            ;UPDATE TEST NUMBER
023570  022712  000244                          CMP     #244,(R2)       ;SEQUENCE ERROR?
023574  001031                                  BNE     TS245-10        ;BR TO ERROR HALT ON SEQ ERROR
023576  005000                                  CLR     R0              ;R0=0
023600  005010                                  CLR     (R0)            ;LOC. 0=0
023602  012737  000377  177776                  MOV     #377,@#PS       ;SET PS=357
023610  106720                                  MFPS    (R0)+           ;TRY MFPS W/MODE 2
023612  103003                                  BCC     MFPS2A          ;BR TO ERROR IF C BIT CLEAR
023614  102402                                  BVS     MFPS2A          ;BR TO ERROR IF V BIT SET
023616  001401                                  BEQ     MFPS2A          ;BR TO ERROR IF Z BIT SET
023620  100404                                  BMI     MFPS2B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

```
                                                                ;            CONDITIONAL BRANCH INST. AND   <====
                                                                ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                ;            WHICH FOLLOWS W/ 765           <====
023622                          MFPS2A:
023622  012742  000560                  MOV     #560,-(R2)      ;MOVE TO MAILBOX #  *******  560  *******
023626  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023630  000000                          HALT                    ;COND. CODES INCORRECT
023632  022737  000357  000000  MFPS2B: CMP     #357,@#0        ;CHECK DEST. DATA
023640  001404                          BEQ     MFPS2C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;            CONDITIONAL BRANCH INST. AND   <====
                                                                ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                ;            WHICH FOLLOWS W/ 755           <====
023642  012742  000561                  MOV     #561,-(R2)      ;MOVE TO MAILBOX #  *******  561  *******
023646  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023650  000000                          HALT                    ;DEST. DATA INCORRECT
023652  022700  000001          MFPS2C: CMP     #1,R0           ;CHECK MODE Z REGISTER
023656  001404                          BEQ     TS245
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;            CONDITIONAL BRANCH INST. AND   <====
                                                                ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                ;            WHICH FOLLOWS W/ 746           <====
023660  012742  000562                  MOV     #562,-(R2)      ;MOVE TO MAILBOX #  *******  562  *******
023664  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023666  000000                          HALT                    ;MODE 2 REGISTER NOT INCREMENTED 1
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 245       TEST MFPS MODE 3
                                ;*******************************************************************************
023670  005212                  TS245:  INC     (R2)            ;UPDATE TEST NUMBER
023672  022712  000245                  CMP     #245,(R2)       ;SEQUENCE ERROR?
023676  001033                          BNE     TS246-10        ;BR TO ERROR HALT ON SEQ ERROR
023700  012700  000406                  MOV     #406,R0         ;R0=406
023704  005037  000000                  CLR     @#0             ;LOC. 0=0
023710  012737  000252  177776          MOV     #252,@#PS       ;PS=252
023716  106730                          MFPS    @(R0)+          ;TRY MFPS WITH MODE 3
023720  103403                          BCS     MFPS3A          ;BR TO ERROR IF C-BIT SET
023722  102402                          BVS     MFPS3A          ;BR TO ERROR IF V-BIT SET
023724  001401                          BEQ     MFPS3A          ;BR TO ERROR IF Z-BIT SET
023726  100404                          BMI     MFPS3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;            CONDITIONAL BRANCH INST. AND   <
                                                                ;            REPLACE THE MOVE INSTRUCTION   <-
                                                                ;            WHICH FOLLOWS W/ 763           <
023730                          MFPS3A:
023730  012742  000563                  MOV     #563,-(R2)      ;MOVE TO MAILBOX #  *******  563  *******
023734  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023736  000000                          HALT                    ;CONDITION CODES INCORRECT
023740  022737  125000  000000  MFPS3B: CMP     #125000,@#0     ;CHECK DEST. DATA
023746  001404                          BEQ     MFPS3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;            CONDITIONAL BRANCH INST. AND   <----
                                                                ;            REPLACE THE MOVE INSTRUCTION   <
                                                                ;            WHICH FOLLOWS W/ 753           <-
023750  012742  000564                  MOV     #564,-(R2)      ;MOVE TO MAILBOX #  *******  564  *******
```

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023754  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023756  000000                          HALT                    ;DEST DATA INCORRECT
023760  020027  000410          MFPS3C: CMP     R0,#410         ;CHECK MODE 3 REGISTER.
023764  001404                          BEQ     TS246
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 744           <====
023766  012742  000565                  MOV     #565,-(R2)      ;MOVE TO MAILBOX #  *******  565  *******
023772  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023774  000000                          HALT                    ;MODE 3 REGISTER NOT INCREMENTED BY 2
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 246       TEST MFPS MODE 4
                                ;*******************************************************************************
023776  005212                  TS246:  INC     (R2)            ;UPDATE TEST NUMBER
024000  022712  000246                  CMP     #246,(R2)       ;SEQUENCE ERROR?
024004  001033                          BNE     TS247-10        ;BR TO ERROR HALT ON SEQ ERROR
024006  012700  000002                  MOV     #2,R0           ;R0=2
024012  005037  000000                  CLR     @#0             ;LOC. 0=0
024016  012737  000125  177776          MOV     #125,@#PS       ;PS=125
024024  106740                          MFPS    -(R0)           ;TRY MFPS W/MODE 4
024026  103003                          BCC     MFPS4A          ;BR TO ERROR IF C-BIT CLEAR
024030  102402                          BVS     MFPS4A          ;BR TO ERROR IF V-BIT SET
024032  001401                          BEQ     MFPS4A          ;BR TO ERROR IF Z-BIT SET
024034  100004                          BPL     MFPS4B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                ;           WHICH FOLLOWS W/ 763           <
024036                          MFPS4A:
024036  012742  000566                  MOV     #566,-(R2)      ;MOVE TO MAILBOX #  *******  566  *******
024042  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024044  000000                          HALT                    ;COND. CODES INCORRECT
024046  022737  042400  000000  MFPS4B: CMP     #42400,@#0      ;CHECK DEST. DATA
024054  001404                          BEQ     MFPS4C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                ;           WHICH FOLLOWS W/ 753           <=
024056  012742  000567                  MOV     #567,-(R2)      ;MOVE TO MAILBOX #  *******  567  *******
024062  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024064  000000                          HALT                    ;DEST. DATA INCORRECT
024066  020027  000001          MFPS4C: CMP     R0,#1           ;CHECK MODE 4 REGISTER
024072  001404                          BEQ     TS247
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 744           <=
024074  012742  000570                  MOV     #570,-(R2)      ;MOVE TO MAILBOX #  *******  570  *******
024100  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024102  000000                          HALT                    ;MODE 4 REGISTER NOT DECREMENTED BY T
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
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                                        ;TEST 247       TEST MFPS MODE 5
                                        ;*******************************************************************************
024104  005212                          TS247:  INC     (R2)            ;UPDATE TEST NUMBER
024106  022712  000247                          CMP     #247,(R2)       ;SEQUENCE ERROR?
024112  001033                                  BNE     TS250-10        ;BR TO ERROR HALT ON SEQ ERROR
024114  012700  000410                          MOV     #410,R0         ;R0=410
024120  012737  177777  000000                  MOV     #-1,@#0         ;LOC. 0=-1
024126  005037  177776                          CLR     @#PS            ;PS=0
024132  106750                                  MFPS    @-(R0)          ;TRY MFPS W/MODE 5
024134  103403                                  BCS     MFPS5A          ;BR TO ERROR IF C-BIT SET
024136  102402                                  BVS     MFPS5A          ;BR TO ERROR IF V-BIT SET
024140  100401                                  BMI     MFPS5A          ;BR TO ERROR IF N-BIT SET
024142  001404                                  BEQ     MFPS5B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 763            <====
024144                                  MFPS5A:
024144  012742  000571                          MOV     #571,-(R2)      ;MOVE TO MAILBOX #  *******  571  *******
024150  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024152  000000                                  HALT                    ;COND. CODES INCORRECT
024154  022737  000377  000000          MFPS5B: CMP     #377,@#0        ;CHECK DEST. DATA
024162  001404                                  BEQ     MFPS5C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 753            <====
024164  012742  000572                          MOV     #572,-(R2)      ;MOVE TO MAILBOX #  *******  572  *******
024170  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024172  000000                                  HALT                    ;DEST DATA INCORRECT
024174  020027  000406                  MFPS5C: CMP     R0,#406         ;CHECK MODE 5 REGISTER
024200  001404                                  BEQ     TS250
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
024202  012742  000573                          MOV     #573,-(R2)      ;MOVE TO MAILBOX #  *******  573  *******
024206  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024210  000000                                  HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 250       TEST MFPS MODE 6
                                        ;*******************************************************************************
024212  005212                          TS250:  INC     (R2)            ;UPDATE TEST NUMBER
024214  022712  000250                          CMP     #250,(R2)       ;SEQUENCE ERROR?
024220  001034                                  BNE     TS251-10        ;BR TO ERROR HALT ON SEQ ERROR
024222  012700  000401                          MOV     #401,R0         ;R0=410
024226  005037  000000                          CLR     @#0             ;LOC. 0=0
024232  012737  000252  177776                  MOV     #252,@#PS       ;PS=252
024240  106760  177377                          MFPS    -401(R0)        ;TRY MFPS W/MODE 6
024244  102403                                  BVS     MFPS6A          ;BR TO ERROR IF V-BIT SET
024246  103402                                  BCS     MFPS6A          ;BR TO ERROR IF C-BIT SET
024250  001401                                  BEQ     MFPS6A          ;BR TO ERROR IF Z-BIT SET
024252  100404                                  BMI     MFPS6B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

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                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 762            <====
024254                          MFPS6A:
024254  012742  000574                  MOV     #574,-(R2)      ;MOVE TO MAILBOX #  *******  574  *******
024260  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024262  000000                          HALT                    ;COND. CODES INCORRECT
024264  022737  000252  000000  MFPS6B: CMP     #252,@#0        ;CHECK DEST. DATA
024272  001404                          BEQ     MFPS6C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 752            <====
024274  012742  000575                  MOV     #575,-(R2)      ;MOVE TO MAILBOX #  *******  575  *******
024300  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024302  000000                          HALT                    ;DEST. DATA INCORRECT
024304  022700  000401          MFPS6C: CMP     #401,R0         ;CHECK DEST. REGISTER
024310  001404                          BEQ     TS251
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 743            <====
024312  012742  000576                  MOV     #576,-(R2)      ;MOVE TO MAILBOX #  *******  576  *******
024316  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024320  000000                          HALT                    ;DEST. DATA INCORRECT
                                                                ; OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 251       TEST MFPS MODE 7
                                ;*******************************************************************************
024322  005212                  TS251:  INC     (R2)            ;UPDATE TEST NUMBER
024324  022712  000251                  CMP     #251,(R2)       ;SEQUENCE ERROR?
024330  001034                          BNE     TS252-10        ;BR TO ERROR HALT ON SEQ ERROR
024332  012700  000777                  MOV     #777,R0         ;R0=777
024336  005037  000000                  CLR     @#0             ;LOC. 0=0
024342  012737  000125  177776          MOV     #125,@#PS       ;PS=125
024350  106770  177407                  MFPS    @-371(R0)       ;TRY MFPS W/MODE 7
024354  102403                          BVS     MFPS7A          ;BR TO ERROR IF V-BIT SET
024356  103002                          BCC     MFPS7A          ;BR TO ERROR IF C-BIT SET
024360  001401                          BEQ     MFPS7A          ;BR TO ERROR IF Z-BIT SET
024362  100004                          BPL     MFPS7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 762            <====
024364                          MFPS7A:
024364  012742  000577                  MOV     #577,-(R2)      ;MOVE TO MAILBOX #  *******  577  *******
024370  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024372  000000                          HALT                    ;CONDITION CODE INCORRECT
024374  022737  042400  000000  MFPS7B: CMP     #42400,@#0      ;CHECK DESTINATION DATA
024402  001404                          BEQ     MFPS7C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 752            <====
024404  012742  000600                  MOV     #600,-(R2)      ;MOVE TO MAILBOX #  *******  600  *******
```

```
024410  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024412  000000                          HALT                    ;DEST. DATA INCORRECT
024414  022700  000777          MFPS7C: CMP     #777,R0         ;CHECK MODE 7 REGISTER
024420  001404                          BEQ     TS252
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                ;           CONDITIONAL BRANCH INST. AND   <---
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 743           <---
024422  012742  000601                  MOV     #601,-(R2)      ;MOVE TO MAILBOX #  *******  601  *******
024426  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024430  000000                          HALT                    ;MODE 7 REGISTER MODIFIED
                                                                ; OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THAT RESET DOES NOT CLEAR THE PSW.
                                ;THE PSW IS LOADED WITH ONES, A RESET IS ISSUED, AND THE
                                ;CONTENTS OF THE PSW ARE CHECKED TO VERIFY THAT THEY HAVE NOT
                                ;CHANGED. THIS TEST IS EXECUTED ONLY ONCE EVERY 240 (DECIMAL)
                                ;ITERATIONS OF PROGRAM.
                                ;
                                ;*******************************************************************************
                                ;TEST 252       TEST THAT RESET DOES NOT CLEAR PSW
                                ;*******************************************************************************
024432  005212                  TS252:  INC     (R2)            ;UPDATE TEST NUMBER
024434  022712  000252                  CMP     #252,(R2)       ;SEQUENCE ERROR?
024440  001010                          BNE     TS253-10        ;BR TO ERROR HALT ON SEQ ERROR
024442  012737  000357  177776          MOV     #357,@#PS               ;MOV ONES TO PSW
024450  000005                          RESET                           ;
024452  022737  000357  177776          CMP     #357,@#PS               ;PSW CORRECT?
024460  001404                          BEQ     TS253
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 767           <=
024462  012742  000602                  MOV     #602,-(R2)      ;MOVE TO MAILBOX #  *******  602  *******
024466  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024470  000000                          HALT                    ;RESET ALTERED PSW
                                                                ;  OR SEQUENCE ERROR
024472                          REST:

                                ;*******************************************************************************
                                ;
                                ;       THE FOLLOWING TEST CHECKS THE INDEPENDENT FUNCTIONING OF BASIC
                                ;DATA PATH COMPONENTS WITH USER MODE SET.
                                ;
                                ;*******************************************************************************
                                ;TEST 253       TEST USER MODE R6 CAN HOLD A ONE IN EVERY POSITION
                                ;*******************************************************************************
024472  005212                  TS253:  INC     (R2)            ;UPDATE TEST NUMBER
024474  022712  000253                  CMP     #253,(R2)       ;SEQUENCE ERROR?
024500  001022                          BNE     TS254-10        ;BR TO ERROR HALT ON SEQ ERROR
024502  012767  000340  153266          MOV     #340,PS         ;LOCK OUT INTERRUPTS WHILE PLAYING WITH R6
024510  052767  140000  153260          BIS     #USRM,PS                ;SET USER MODE
024516  012706  000001                  MOV     #1,R6                   ;SET BIT0
024522  000241                          CLC                             ;CLEAR C-BIT
```

```
024524  006106                  USP1:   ROL     R6                      ;ROTATE 1 POSITION
024526  103376                          BCC     USP1                    ;BR IF NOT ALL DONE
024530  001407                          BEQ     USP1A                   ;BR IF NO BITS PICKED
024532  042767  140000  153236          BIC     #USRM,PS                ;CLEAR USER MODE
024540  012742  000603                  MOV     #603,-(R2)      ;MOVE TO MAILBOX #  *******  603  *******
024544  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024546  000000                          HALT                    ;USER MODE R6 PICKED A BIT
024550  042767  140000  153220  USP1A:  BIC     #USRM,PS                ;CLEAR USER MODE


                                ;*******************************************************************
                                ;
                                ;       THIS TEST CHECKS THE INDEPENDENT FUNCTIONING OF THE USER
                                ;AND KERNEL MODE R6'S. R6 IS SETUP AND ADDRESSED IN EACH
                                ;OF THE TWO MODES TO VERIFY THAT THE TWO R6'S ARE INDEPENDENT
                                ;OF EACH OTHER.
                                ;
                                ;*******************************************************************
                                ;TEST 254       TEST INDEPENDENCE OF USER AND KERNEL MODE R6'S
                                ;*******************************************************************
024556  005212                  TS254:  INC     (R2)            ;UPDATE TEST NUMBER
024560  022712  000254                  CMP     #254,(R2)       ;SEQUENCE ERROR?
024564  001046                          BNE     USP4-10         ;BR TO ERROR HALT ON SEQ ERROR
024566  012767  000340  153202          MOV     #340,PS         ;LOCK OUT INTERRUPTS WHILE PLAYING WITH R6
024574  052767  140000  153174          BIS     #USRM,PS                ;SET USER MODE
024602  012706  177777                  MOV     #-1,R6                  ;SET USER R6 TO ALL ONES
024606  022706  177777                  CMP     #-1,R6                  ;READ AND CHECK USER R6
024612  001407                          BEQ     USP2                    ;BR IF NO ERROR
024614  042767  140000  153154          BIC     #USRM,PS                ;CLEAR USER MODE
024622  012742  000604                  MOV     #604,-(R2)      ;MOVE TO MAILBOX #  *******  604  *******
024626  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024630  000000                          HALT                    ;USER R6 WILL NOT HOLD ALL ONES
024632  042767  140000  153136  USP2:   BIC     #USRM,PS                ;SET KERNEL MODE
024640  022706  177777                  CMP     #-1,R6                  ;KERNEL MODE R6 ADDR. FROM USER MODE?>>
024644  001004                          BNE     USP3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 747           <
024646  012742  000605                  MOV     #605,-(R2)      ;MOVE TO MAILBOX #  *******  605  *******
024652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024654  000000                          HALT                    ;DUAL ADDRESSING ERROR USER/KERNEL R6
024656  005006                  USP3:   CLR     R6                      ;CLEAR KERNEL MODE SP
024660  052767  140000  153110          BIS     #USRM,PS                ;SET USER MODE
024666  022706  177777                  CMP     #-1,R6                  ;CHECK USER R6 NOT ADDR. FROM KERNEL MODE
024672  042767  140000  153076          BIC     #USRM,PS                ;CLEAR USER MODE
024700  001404                          BEQ     USP4                    ;BR IF NO ERROR
024702  012742  000606                  MOV     #606,-(R2)      ;MOVE TO MAILBOX #  *******  606  *******
024706  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024710  000000                          HALT                    ;DUAL ADDRESSING ERROR OR SEQUENCE ERROR
024712  012706  001000          USP4:   MOV     #STBOT,R6               ;RESTORE SP USER
024716  042767  140000  153052          BIC     #USRM,PS                ;SET KERNEL MODE
024724  012706  001000                  MOV     #STBOT,R6               ;RESTORE SP KERNEL

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

```
                                        ;       THESE NEXT TWO TESTS VERIFY MFPI AND MTPI INSTRUCTIONS
                                        ;WITH R6 IN MODE 0.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 255       TEST MFPI WITH R6 IN MODE 0
                                        ;*******************************************************************
024730  005212                          TS255:  INC     (R2)                    ;UPDATE TEST NUMBER
024732  022712  000255                          CMP     #255,(R2)               ;SEQUENCE ERROR?
024736  001032                                  BNE     TS256-10                ;BR TO ERROR HALT ON SEQ ERROR
024740  012706  001000                          MOV     #STBOT,R6                       ;INITIALIZE KERNEL STACK POINTER
024744  012767  140000  153024                  MOV     #USRM,PS                        ;SET USER MODE.PREVIOUS KERNEL
024752  012706  027324                          MOV     #USTBOT,R6                      ;INITIALIZE USER STACK POINTER
024756  006506                                  MFPI    R6                              ;TRY MFPI WITH MODE 0
024760  022767  140000  153010                  CMP     #140000,PS                      ;CHECK PSW
024766  001407                                  BEQ     MFPI0                           ;BR IF NO ERROR
024770  042767  140000  153000                  BIC     #USRM,PS                        ;CLEAR USER MODE
024776  012742  000607                          MOV     #607,-(R2)              ;MOVE TO MAILBOX #  *******  607  *******
025002  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025004  000000                                  HALT                            ;INCORRECT PSW FROM MFPI
025006  042767  140000  152762          MFPI0:  BIC     #USRM,PS                        ;CLEAR USER MODE
025014  022767  001000  002300                  CMP     #STBOT,USTBOT-2                 ;CHECK DATA ON STACK
025022  001404                                  BEQ     MFPI0A                          ;BR IF NO ERROR
025024  012742  000610                          MOV     #610,-(R2)              ;MOVE TO MAILBOX #  *******  610  *******
025030  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025032  000000                                  HALT                            ;INCORRECT DATA FROM MFPI
025034                                  MFPI0A:

                                        ;*******************************************************************
                                        ;TEST 256       TEST MTPI WITH R6 IN MODE 0
                                        ;*******************************************************************
025034  005212                          TS256:  INC     (R2)                    ;UPDATE TEST NUMBER
025036  022712  000256                          CMP     #256,(R2)               ;SEQUENCE ERROR?
025042  001035                                  BNE     TS257-10                ;BR TO ERROR HALT ON SEQ ERROR
025044  012767  000340  152724                  MOV     #340,PS                         ;SET KERNEL MODE AND LOCK OUT INTERRUPTS
025052  005006                                  CLR     R6                              ;INITIALIZE KERNEL R6
025054  052767  140000  152714                  BIS     #USRM,PS                        ;SET USER MODE/PREVIOUS KERNEL
025062  012706  027324                          MOV     #USTBOT,R6                      ;INITIALIZE USER STACK POINTER
025066  012746  001000                          MOV     #STBOT,-(R6)                    ;SET UP TARGET DATA
025072  006606                                  MTPI    R6                              ;TRY MODE 0 MTPI
025074  022767  140340  152674                  CMP     #140340,PS                      ;CHECK PSW
025102  001407                                  BEQ     MTPI0                           ;BR IF NO ERROR
025104  042767  140000  152664                  BIC     #USRM,PS                        ;CLEAR USER MODE
025112  012742  000611                          MOV     #611,-(R2)              ;MOVE TO MAILBOX #  *******  611  *******
025116  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025120  000000                                  HALT                            ;PS INCORRECT FOLLOWING MTPI
025122  042767  140000  152646          MTPI0:  BIC     #USRM,PS                        ;SET KERNEL MODE
025130  020627  001000                          CMP     R6,#STBOT                       ;CHECK TARGET DATA
025134  001404                                  BEQ     TS257
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                                ;           CONDITIONAL BRANCH INST. AND   <--
                                                                                ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                                ;           WHICH FOLLOWS W/ 742           <--
025136  012742  000612                          MOV     #612,-(R2)              ;MOVE TO MAILBOX #  *******  612  *******
025142  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025144  000000                                  HALT                            ;DATA INCORRECT FOLLOWING MTPI
                                                                                ;  OR SEQUENCE ERROR
```

/9C7

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST EXECUTES EVERY POSSIBLE BRANCH WITH EVERY POSSIBLE
                                        ;CONDITION CODE COMBINATION.
                                        ;       THE ROUTINE USES TWO TABLES.  THE BRANCH TABLE HOLDS ALL THE
                                        ;POSSIBLE BRANCH INSTRUCTIONS, THE OTHER TABLE (YNTAB) HOLDS BIT MAPS FOR
                                        ;EACH BRANCH.  A ONE IN THE BIT MAP INDICATES THAT THE CORRESPONDING
                                        ;BRANCH INSTRUCTION SHOULD BRANCH FOR THE CONDITION CODE SETTING WHICH
                                        ;CORRESPONDS TO THE BIT POSITION WITHIN THE MAP.  FOR EXAMPLE IF THE LEFT
                                        ;MOST BIT IS A ONE THEN THE CORRESPONDING BRANCH INSTRUCTION SHOULD BRANCH
                                        ;WHEN THE CONDITION CODES ARE 0.
                                        ;       THE ROUTINE CONSISTS OF NESTED LOOPS; THE OUTER LOOP SETS UP
                                        ;ALL THE POSSIBLE BRANCH INSTRUCTIONS.  THE INNER LOOP SETS UP EVERY POSSIBLE
                                        ;CONDITION CODE FOR EACH BRANCH.
                                        ;       THE BIT MAP IS USED TO SET THE ADDRESS LOCATION IN TWO
                                        ;JUMP MODE 3 INSTRUCTIONS.  THE ADDRESSES ARE CHANGED TO ALLOW THE
                                        ;PROGRAM TO CONTINUE OR JUMP TO AN ERROR ROUTINE DEPENDING UPON
                                        ;WHETHER IT HANDLED THE BRANCH INSTRUCTION CORRECTLY.
                                        ;       AT ANY ERROR HALT, LOCATION, BRH, HOLDS THE BRANCH INSTRUCTION
                                        ;UNDER TEST AND LOCATION, CC, HOLDS THE VALUE OF THE CONDITION CODES
                                        ;AT THE TIME THE BRANCH WAS EXECUTED.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 257       TEST THE BRANCH ROM
                                        ;*******************************************************************************
025146  005212                          TS257:  INC     (R2)            ;UPDATE TEST NUMBER
025150  022712  000257                          CMP     #257,(R2)       ;SEQUENCE ERROR?
025154  001062                                  BNE     ER              ;BR TO ERROR HALT ON SEQ ERROR
025156  012700  027214                  SETUP:  MOV     #BRTAB,R0       ;INITIALIZE BRANCH TABLE POINTER
025162  012704  027252                          MOV     #YNTAB,R4       ;INITIALIZE YES/NO BRANCH MAP POINTER
025166  012767  000017  000142                  MOV     #15.,BRCT       ;INITIALIZE BRANCH TABLE COUNT
025174  012067  000110                  SETBR:  MOV     (R0)+,BRH       ;GET NEXT BRANCH INST.
025200  012401                                  MOV     (R4)+,R1        ;GET NEXT BRANCH MAP
025202  012767  177777  000074                  MOV     #-1,CC1         ;INITIALIZE CONDITION CODE VALUE
025210  012703  000020                          MOV     #16.,R3         ;INITIALIZE CONDITION CODE COUNT
025214  005267  000064                  SETCC:  INC     CC1             ;SET FOR NEXT CC VALUE
025220  032701  100000                          BIT     #100000,R1      ;SEE IF SHOULD BR W/ THESE CC'S
025224  013705  177776                          MOV     @#177776,R5     ;SIMULATE A JNE
025230  042705  177773                          BIC     #177773,R5      ;       (JUMP NOT EQUAL)
025234  000165  025240                          JMP     .+4(R5)         ;       TO SET2BR
025240  000167  000020                          JMP     SET2BR
025244  012767  025340  000042                  MOV     #CONT,NBR       ;SET TO CONTINUE IF NO BRANCH
025252  012767  025322  000040                  MOV     #ER,YBR         ;SET TO REPORT ERROR IF BRANCH
025260  000167  000014                          JMP     AROUN           ;GO AROUND OPPOSITE CONDITION
025264  012767  025322  000022  SET2BR: MOV     #ER,NBR         ;SET TO REPORT ERROR IF NO BRANCH
025272  012767  025340  000020                  MOV     #CONT,YBR       ;SET TO CONTINUE IF BRANCH
025300  006101                          AROUN:  ROL     R1              ;UPDATE BIT MAP

025302  012737                                  MOV     (PC)+,@(PC)+    ;SET CONDITION CODE
025304  000000                          CC1:    0                       ;NEW CC VALUE GOES HERE
025306  177776                                  177776
025310  000000                          BRH:    0                       ;BRANCH INST. GOES HERE
025312  000137                                  JMP     @(PC)+          ;THIS JUMP IF NO BRANCH
025314  000000                          NBR:    0                       ;WHERE TO GO IF NO BRANCH OCCURS
025316  000137                                  JMP     @(PC)+          ;THIS JUMP IF BRANCH OCCURS
```

```
025320  000000                  VBR:    0                       ;WHERE TO GO IF BRANCH OCCURS
025322  012702  000304          FR:     MOV     #$TESTN,R2      ;RESTORE POINTER
025326  012742  000613                  MOV     #613,-(R2)      ;MOVE TO MAILBOX #  *******  613  *******
025332  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025334  000000                          HALT                    ;
025336  000000                  BRCT:   0
025340  005303                  CONT:   DEC     R3              ;CC'S DONE?
025342  013705  177776                  MOV     @#177776,R5     ;SIMULATE A JNE
025346  042705  177773                  BIC     #177773,R5      ;       (JUMP NOT EQUAL)
025352  000165  025356                  JMP     .+4(R5)         ;       TO SETCC
025356  000167  177632                  JMP     SETCC
025362  005367  177750                  DEC     BRCT            ;BR'S DONE?
025366  013705  177776                  MOV     @#177776,R5     ;SIMULATE A JNE
025372  042705  177773                  BIC     #177773,R5      ;       (JUMP NOT EQUAL)
025376  000165  025402                  JMP     .+4(R5)         ;       TO SETBR
025402  000167  177566                  JMP     SETBR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;THE FOLLOWING TEST VERIFIES THAT NO DUAL ADDRESSING OF THE GENERAL
                                        ;REGISTERS OCCURS. ALL REGISTERS ARE CLEARED, AND A UNIQUE BIT IS SET
                                        ;IN EACH. CMP INSTRUCTIONS CHECK THAT ONLY ONE BIT IS SET IN EACH
                                        ;REGISTER.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 260       DUAL REGISTER ADDRESSING TEST
                                        ;*******************************************************************
025406  005212                          TS260:  INC     (R2)            ;UPDATE TEST NUMBER
025410  022712  000260                          CMP     #260,(R2)       ;SEQUENCE ERROR?
025414  001051                                  BNE     DAERR           ;BR TO ERROR HALT ON SEQ ERROR
025416  005000                          BITCLR: CLR     R0              ;INITIALIZE ALL REGISTERS
025420  005001                                  CLR     R1
025422  005002                                  CLR     R2
025424  005003                                  CLR     R3
025426  005004                                  CLR     R4
025430  005005                                  CLR     R5
025432  052700  000001                  BITSET: BIS     #1,R0           ;SET R0 1
025436  052701  000002                          BIS     #2,R1           ;R1=2
025442  052702  000004                          BIS     #4,R2           ;R2=4
025446  052703  000010                          BIS     #10,R3          ;R3-10
025452  052704  000020                          BIS     #20,R4          ;R4-20
025456  052705  000040                          BIS     #40,R5          ;R5=40
025462  052706  001000                          BIS     #1000,R6        ;R6=1000
025466  022706  001000                  BITCHK: CMP     #1000,R6        ;TEST THAT NO DUAL ADDRESSING OCCURRED
025472  001022                                  BNE     DAERR           ;BR TO ERROR HALT IF ANY OTHER BITS ARE SET
025474  022705  000040                          CMP     #40,R5
025500  001017                                  BNE     DAERR
025502  022704  000020                          CMP     #20,R4
025506  001014                                  BNE     DAERR
025510  022703  000010                          CMP     #10,R3
025514  001011                                  BNE     DAERR
025516  022702  000004                          CMP     #4,R2
025522  001006                                  BNE     DAERR
025524  022701  000002                          CMP     #2,R1
025530  001003                                  BNE     DAERR
025532  022700  000001                          CMP     #1,R0
025536  001404                                  BEQ     BITCON
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 726           <
025540                                  DAERR:
025540  012742  000614                          MOV     #614,-(R2)      ;MOVE TO MAILBOX # ******* 614 *******
025544  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025546  000000                                  HALT                    ;DUAL ADDRESSING ERROR
025550  012702  000304                  BITCON: MOV     #$TESTN,R2      ;RESTORE POINTER
```

```
                                        ;*******************************************************************************
                                        ;       THIS TEST VERIFIES THAT THE UPPER BYTE OF THE PSW IS NOT AFFECTED
                                        ;WHEN THE PRIORITY LEVEL OR CC'S ARE CHANGED. ALL BITS ARE
                                        ;INITIALLY SET IN THE PSW, AND THE LOW BYTE IS CLEARED. A BIT
                                        ;INSTRUCTION VERIFIES THE DATA.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 261       TEST BYTE INSTRUCTION ON PSW
                                        ;*******************************************************************************
025554  005212                          TS261:  INC     (R2)            ;UPDATE TEST NUMBER
025556  022712  000261                          CMP     #261,(R2)       ;SEQUENCE ERROR?
025562  001012                                  BNE     BTERR           ;BR TO ERROR HALT ON SEQ ERROR
025564  052737  170357  177776                  BIS     #170357,@#PS    ;SET ALL POSSIBLE BITS IN PSW
025572  105037  177776                          CLRB    @#PS            ;CLR PR LEVEL AND CC'S
025576  013700  177776                          MOV     @#PS,R0         ;COPY CONTENTS OF PSW
025602  022700  170004                          CMP     #170004,R0      ;TEST THAT CLRB AFFECTED ONLY LOW BYTE
025606  001006                                  BNE     BTCON           ;CONTINUE IF OK
025610  005037  177776                  BTERR:  CLR     @#PS            ;RETURN TO KERNEL MODE
025614  012742  000615                          MOV     #615,-(R2)      ;MOVE TO MAILBOX #  *******  615  *******
025620  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025622  000000                                  HALT                    ;BYTE INSTRUCTION ALTERED PSW
025624  005037  177776                  BTCON:  CLR     @#PS            ;RETURN TO KERNEL MODE

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THAT A JMP INSTRUCTION DOES NOT ALTER THE
                                        ;CONDITION CODES IN THE PSW. THE CC'S ARE PRESET,THE JMP IS
                                        ;EXECUTED, AND CONDITIONAL BRANCHES VERIFY THE STATE OF THE CC'S.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 262       TEST THAT JMP INSTRUCTION DOES NOT AFFECT CONDITION CODES
                                        ;*******************************************************************************
025630  005212                          TS262:  INC     (R2)            ;UPDATE TEST NUMBER
025632  022712  000262                          CMP     #262,(R2)       ;SEQUENCE ERROR?
025636  001010                                  BNE     TS263-10        ;BR TO ERROR HALT ON SEQ ERROR
025640  000277                                  SCC
025642  000252                                  +CLN.CLV                ;CC-0101
025644  000167  000000                          JMP     JMPT            ;JUMP TO TEST PSW
025650  100403                          JMPT:   BMI     JMPERR          ;BR TO ERROR HALT IF N-BIT IS SET
025652  001002                                  BNE     JMPERR          ;BR TO ERROR HALT IF Z-BIT IS CLEAR
025654  102401                                  BVS     JMPERR          ;BR TO ERROR HALT IF V-BIT IF SET
025656  103404                                  BCS     TS263
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                                        ;           WHICH FOLLOWS W/ 767           <
025660                                  JMPERR:
025660  012742  000616                          MOV     #616,-(R2)      ;MOVE TO MAILBOX #  *******  616  *******
025664  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025666  000000                                  HALT                    ;JMP INSTRUCTION AFFECTED CC'S
                                                                        ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE SET AND CLEAR CONDITION CODE INSTRUCTIONS.
                                        ;THE TEST CONSISTS OF TWO ROUTINES, ONE TO TEST ALL CLEAR CC
                                        ;INSTRUCTIONS, AND THE SECOND TO TEST ALL SET CC INSTRUCTIONS. ALL
                                        ;POSSIBLE COMBINATIONS OF CONDITION CODES ARE TESTED, INCLUDING NOP'S.
                                        ;       TO TEST THE CLEAR CC INSTRUCTIONS, ALL CONDITION CODES ARE
                                        ;INITIALLY SET. THE INSTRUCTION IS EXECUTED, AND THE PSW IS CHECKED
                                        ;TO VERIFY THE PROPER COMBINATION OF CONDITION CODES.
                                        ;       TO TEST THE SET CC INSTRUCTIONS, THE CONDITION CODES ARE
                                        ;INITIALLY CLEARED, AND ONLY THE REQUIRED BITS ARE SET BY THE SET CC
                                        ;INSTRUCTION. THE CONTENTS OF THE PSW ARE CHECKED TO VERIFY THAT
                                        ;ONLY THE REQUIRED BITS WERE SET.
                                        ;
                                        ;*******************************************************************
                                        ;TEST 263       TEST SET CC AND CLEAR CC INSTRUCTIONS
                                        ;*******************************************************************
025670  005212                          TS263:  INC     (R2)            ;UPDATE TEST NUMBER
025672  022712  000263                          CMP     #263,(R2)       ;SEQUENCE ERROR?
025676  001062                                  BNE     CCERR           ;BR TO ERROR HALT ON SEQ ERROR
025700  012767  000240  000024                  MOV     #240,CC3        ;INITIALIZE CLR CC INSTRUCTION CODES
025706  012767  000017  000032                  MOV     #17,CC2         ;INITIALIZE OCTAL MAP
025714  012767  000261  000102                  MOV     #261,SC3        ;INITIALIZE SET CC INSTRUCTION CODES
025722  012767  000001  000110                  MOV     #1,SC4          ;INITIALIZE OCTAL MAP
025730  000277                          CLRCD:  SCC                     ;SET ALL CONDITION CODES
025732  000000                          CC3:    0                       ;CONDITION CODE INSTRUCTION
025734  013704  177776                          MOV     @#PS,R4         ;COPY THE PSW
025740  042704  177760                          BIC     #177760,R4      ;ISOLATE CONDITION CODES
025744  022704                                  CMP     (PC)+,R4        ;CHECK THAT PROPER CC'S WERE CLEARED
025746  000000                          CC2:    0                       ;OCTAL REPRESENTATION OF CC'S
025750  001404                                  BEQ     CON1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
                                                                        ;           WHICH FOLLOWS W/ 752           <---
025752  012742  000617                          MOV     #617,-(R2)      ;MOVE TO MAILBOX #  *******  617  *******
025756  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025760  000000                                  HALT                    ;CLEAR CC INSTRUCTION FAILED
025762  005367  177760                  CON1:   DEC     CC2             ;SET NEXT OCTAL MAP OF CC'S
025766  005267  177740                          INC     CC3             ;GET NEXT CLEAR CC INSTRUCTION
025772  026727  177734  000257                  CMP     CC3,#257        ;TEST FOR CCC INSTRUCTION
026000  003753                                  BLE     CLRCD           ;GO TEST NEXT INSTRUCTION IF NOT FOUND
026002  026727  177724  000260                  CMP     CC3,#260        ;CHECK FOR NOP=260
026010  001004                                  BNE     SETCD           ;GO TEST SET CC INSTRUCTIONS
026012  012767  000017  177726                  MOV     #17,CC2         ;SET OCTAL MAP TO TEST NOP
026020  000743                                  BR      CLRCD           ;GO TEST NOP
026022  000257                          SETCD:  CCC                     ;CLEAR ALL CONDITION CODES
026024  000000                          SC3:    0                       ;CONDITION CODE INSTRUCTION
026026  013704  177776                          MOV     @#PS,R4         ;COY PSW
026032  042704  177760                          BIC     #177760,R4      ;CLEAR AWAY UNWANTED BITS
026036  022704                                  CMP     (PC)+,R4        ;CHECK THAT PROPER CC'S WERE SET
026040  000000                          SC4:    0                       ;OCTAL REPRESENTATION OF CC'S
026042  001404                                  BEQ     CON2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                        ;           CONDITIONAL BRANCH INST. AND   <---
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <---
```

```
8138                                                                    ;          WHICH FOLLOWS W/ 715          <---=
8139  026044                          CCERR:
8140  026044  012742  000620                  MOV     #620,-(R2)        ;MOVE TO MAILBOX #  *******  620  *******
8141  026050  005242                          INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
8142  026052  000000                          HALT                      ;SET CC FAILED OR SEQUENCE ERROR
8143  026054  005267  177760          CON2:   INC     SC4               ;SET NEXT OCTAL MAP
8144  026060  005267  177740                  INC     SC3               ;PREPARE NEXT SET CC INSTRUCTION
8145  026064  026727  177734  000277          CMP     SC3,#277          ;FINISHED?
8146  026072  003753                          BLE     SETCD             ;BR IF NO
8147  026074  000167  000006                  JMP     MORO              ;JUMP TO NEXT TESTS
```

```
                                        ;*******************************************************************************
                                        .SBTTL  TEST INSTRUCTIONS USING SAME REGISTER FOR SOURCE & DESTINATION
                                        ;
                                        ;IN AUTO INCREMENT (DECREMENT) MODES AND
                                        ;AUTO INCREMENT (DECREMENT) DEFERRED MODES,
                                        ;CONTENTS OF THE REGISTER IN USED ARE
                                        ;INCREMENTED (DECREMENTED) BY 2
                                        ;BEFORE USED AS THE SOURCE OPERAND.
                                        ;
026100  000000  000000  000000          A:      .WORD 0,0,0
026106                                  MOR0:
                                        ;*******************************************************************************
                                        ;TEST 264       TEST AUTO-INCREMENT MODE, USING R0
                                        ;*******************************************************************************
026106  005212                          TS264:  INC     (R2)            ;UPDATE TEST NUMBER
026110  022712  000264                          CMP     #264,(R2)       ;SEQUENCE ERROR?
026114  001020                                  BNE     TS265-10        ;BR TO ERROR HALT ON SEQ ERROR
026116  005037  026100                          CLR     @#A             ;CLEAR LOC A
026122  012700  026100                          MOV     #A,R0           ;R0 STORES ADDR OF A
026126  060020                                  ADD     R0,(R0)+        ;CHECK THAT R0 IS INCR BY 2 BEFORE
                                                                        ;BEING USED AS THE SOURCE OPERAND
026130  022700  026102                          CMP     #A+2,R0         ;R0 INCR BY 2?
026134  001404                                  BEQ     MOR1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                        ;           CONDITIONAL BRANCH INST. AND    <-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                        ;           WHICH FOLLOWS W/ 767            <-
026136  012742  000621                          MOV     #621,-(R2)      ;MOVE TO MAILBOX #  *******  621  *******
026142  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026144  000000                                  HALT                    ;R0 WAS NOT INCREMENTED BY 2
                                                                        ;
026146  022737  026102  026100  MOR1:           CMP     #A+2,@#A        ;CHECK CONTENT OF R0 WAS INCR BY 2 BEFORE
                                                                        ;BEING USED IN THE "ADD" INSTR
                                                                        ;LOC A CONTAINS (A+2)?
026154  001404                                  BEQ     TS265
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===-
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==-=
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==-=
                                                                        ;           WHICH FOLLOWS W/ 757            <==-=
026156  012742  000622                          MOV     #622,-(R2)      ;MOVE TO MAILBOX #  *******  622  *******
026162  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026164  000000                                  HALT                    ;WRONG SUM IN LOC A
                                                                        ;  OR SEQUENCE ERROR


                                        ;*******************************************************************************
                                        ;TEST 265       AUTO-DECREMENT MODE, USING R0
                                        ;*******************************************************************************
026166  005212                          TS265:  INC     (R2)            ;UPDATE TEST NUMBER
026170  022712  000265                          CMP     #265,(R2)       ;SEQUENCE ERROR?
026174  001020                                  BNE     TS266-10        ;BR TO ERROR HALT ON SEQ ERROR
026176  005037  026100                          CLR     @#A             ;CLEAR LOC A
026202  012700  026102                          MOV     #A+2,R0         ;R0 STORES ADDR OF A+2
026206  060040                                  ADD     R0,-(R0)        ;CHECK THAT R0 IS DECR BY 2 BEFORE
                                                                        ;BEING USED AS THE SOURCE OPERAND
026210  022700  026100                          CMP     #A,R0           ;R0 DECR BY 2?
026214  001404                                  BEQ     MOR2
```

```
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 767            <====
026216  012742  000623                  MOV     #623,-(R2)              ;MOVE TO MAILBOX #  *******  623  *******
026222  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
026224  000000                          HALT                            ;R0 WAS NOT DECREMENTED BY 2
                                                                        ;
026226  022737  026100  026100  MOR2:   CMP     #A,@#A                  ;CONTENT OF R0 WAS DECR BY 2 BEFORE
                                                                        ;BEING USED IN THE ''ADD'' INSTR
                                                                        ;LOC A CONTAINS (R0)
026234  001404                          BEQ     TS266
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 757            <====
026236  012742  000624                  MOV     #624,-(R2)              ;MOVE TO MAILBOX #  *******  624  *******
026242  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
026244  000000                          HALT                            ;WRONG SUM IN LOC A
                                                                        ;  OR SEQUENCE ERROR
                                                                        ;
                                ;*******************************************************************************
                                ;TEST 266       TEST AUTO-INCREMENT DEFERRED MODE, USING R0
                                ;*******************************************************************************
026246  005212                  TS266:  INC     (R2)                    ;UPDATE TEST NUMBER
026250  022712  000266                  CMP     #266,(R2)               ;SEQUENCE ERROR?
026254  001044                          BNE     TS267-10                ;BR TO ERROR HALT ON SEQ ERROR
026256  005037  026100                  CLR     @#A                     ;CLEAR LOC A
026262  005037  026104                  CLR     @#A+4                   ;CLEAR LOC A+4
026266  012737  026100  026102          MOV     #A,@#A+2                ;STORE ADDR A IN LOC A+2
026274  012700  026102                  MOV     #A+2,R0                 ;R0 STORES ADDR A+2
026300  060030                          ADD     R0,@(R0)+               ;CHECK THAT R0 IS INCR BY 2 BEFORE
                                                                        ;BEING USED AS THE SOURCE OPERAND
026302  022700  026104                  CMP     #A+4,R0                 ;R0 INCR BY 2?
026306  001404                          BEQ     MOR3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=-=
                                                                        ;           CONDITIONAL BRANCH INST. AND    <=-=
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <=-=
                                                                        ;           WHICH FOLLOWS W/ 762            <=-=
026310  012742  000625                  MOV     #625,-(R2)              ;MOVE TO MAILBOX #  *******  625  *******
026314  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
026316  000000                          HALT                            ;R0 WAS NOT INCREMENTED BY 2
                                                                        ;
026320  022737  026100  026102  MOR3:   CMP     #A,@#A+2                ;LOC A+2 STILL STORES ADDR A?
026326  001404                          BEQ     MOR4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <==
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <==
                                                                        ;           WHICH FOLLOWS W/ 752            <==
026330  012742  000626                  MOV     #626,-(R2)              ;MOVE TO MAILBOX #  *******  626  *******
026334  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
026336  000000                          HALT                            ;LOC A+2 STORES WRONG DATA
                                                                        ;
026340  022737  026104  026100  MOR4:   CMP     #A+4,@#A                ;CHECK CONTENT OF R0 WAS INCR BY 2 BEFORE
                                                                        ;BEING USED IN THE ''ADD'' INSTR
026346  001404                          BEQ     MOR5
```

```
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 742            <====
026350  012742  000627                  MOV     #627,-(R2)      ;MOVE TO MAILBOX #  *******  627  *******
026354  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026356  000000                          HALT                    ;LOC A STORES WRONG DATA
                                                                ;
026360  005737  026104          MOR5:   TST     @#A+4           ;LOC A+4 STILL STORES 0?
026364  001404                          BEQ     TS267
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 733            <====
026366  012742  000630                  MOV     #630,-(R2)      ;MOVE TO MAILBOX #  *******  630  *******
026372  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026374  000000                          HALT                    ;LOC A+4 DID NOT STAY CLEAR
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 267       TEST AUTO-DECREMENT DEFERRED, USING R0
                                ;*******************************************************************************
026376  005212                  TS267:  INC     (R2)            ;UPDATE TEST NUMBER
026400  022712  000267                  CMP     #267,(R2)       ;SEQUENCE ERROR?
026404  001044                          BNE     TS270-10        ;BR TO ERROR HALT ON SEQ ERROR
026406  005037  026100                  CLR     @#A             ;CLEAR LOC A
026412  005037  026104                  CLR     @#A+4           ;CLEAR LOC A+4
026416  012700  026104                  MOV     #A+4,R0         ;R0 STORES ADDR A+4
026422  012737  026100  026102          MOV     #A,@#A+2        ;STORE ADDR A IN LOC A+2
026430  060050                          ADD     R0,@-(R0)       ;CHECK THAT R0 IS DECR BY 2 BEFORE
                                                                ;BEING USED AS THE SOURCE OPERAND
026432  022700  026102                  CMP     #A+2,R0         ;R0 DECREMENTED BY 2?
026436  001404                          BEQ     MOR6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 762            <
026440  012742  000631                  MOV     #631,-(R2)      ;MOVE TO MAILBOX #  *******  631  *******
026444  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026446  000000                          HALT                    ;R0 WAS NOT DECREMENTED BY 2
                                                                ;
026450  022737  026102  026100  MOR6:   CMP     #A+2,@#A        ;CHECK CONTENT OF R0 WAS DECR BY 2 BEFORE
                                                                ;BEING USED IN THE "ADD" INSTR
026456  001404                          BEQ     MOR7
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 752            <
026460  012742  000632                  MOV     #632,-(R2)      ;MOVE TO MAILBOX #  *******  632  *******
026464  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026466  000000                          HALT                    ;LOC A STORES WRONG DATA


                                                                ;
026470  022737  026100  026102  MOR7:   CMP     #A,@#A+2        ;LOC A+2 STILL STORES A?
026476  001404                          BEQ     MOR8
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
```

```
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 742           <====
026500  012742  000633                  MOV     #633,-(R2)      ;MOVE TO MAILBOX #  *******  633  *******
026504  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026506  000000                          HALT                    ;LOC A+2 STORES WRONG DATA
                                                                ;
026510  005737  026104          MOR8:   TST     @#A+4           ;LOC A+4 STILL STORES 0?
026514  001404                          BEQ     TS270
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 733           <====
026516  012742  000634                  MOV     #634,-(R2)      ;MOVE TO MAILBOX #  *******  634  *******
026522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026524  000000                          HALT                    ;LOC A+4 DID NOT STAY CLEAR
                                                                ;  OR SEQUENCE ERROR
                                                                ;
```

```
                                        ;*******************************************************************************
                                        .SBTTL  INSTRUCTION USING PC AS SOURCE REGISTER
                                        ;
                                        ;IN INDEX, INDEX DEFERRED, RELATIVE, AND
                                        ;RELATIVE DEFERRED MODES, DESTINATION WILL CONTAIN
                                        ;THE PC COUNT OF THE CURRENT INSTRUCTION +4.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 270       TEST PC AS SOURCE IN MODE 0, USING R0
                                        ;*******************************************************************************
026526  005212                          TS270:  INC     (R2)            ;UPDATE TEST NUMBER
026530  022712  000270                          CMP     #270,(R2)       ;SEQUENCE ERROR?
026534  001006                                  BNE     TS271-10        ;BR TO ERROR HALT ON SEQ ERROR
026536  012700  177777                          MOV     #-1,R0          ;SET ALL 1 IN R0
026542  010700                          PCN01:  MOV     PC,R0           ;STORES PC IN R0
026544  022700  026544                          CMP     #PCN01+2,R0     ;R0 STORES PC+2?
026550  001404                                  BEQ     TS271
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <--
                                                                        ;           CONDITIONAL BRANCH INST. AND    <---
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <===
                                                                        ;           WHICH FOLLOWS W/ 771            <=
026552  012742  000635                          MOV     #635,-(R2)      ;MOVE TO MAILBOX #  *******  635  *******
026556  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026560  000000                                  HALT                    ;R0 STORED WRONG VALUE
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 271       TEST PC AS SOURCE IN MODE 6, USING R0
                                        ;*******************************************************************************
026562  005212                          TS271:  INC     (R2)            ;UPDATE TEST NUMBER
026564  022712  000271                          CMP     #271,(R2)       ;SEQUENCE ERROR?
026570  001010                                  BNE     TS272-10        ;BR TO ERROR HALT ON SEQ ERROR
026572  012700  026100                          MOV     #A,R0           ;R0 STORES ADDR A
026576  010760  000004                  PCN2:   MOV     PC,4(R0)                ;EFFECTIVE ADDR IS A+4
026602  022737  026602  026104                  CMP     #PCN2+4,@#A+4   ;LOC A+4 STORES PC+4?
026610  001404                                  BEQ     TS272
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===
                                                                        ;           CONDITIONAL BRANCH INST. AND    <==-
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <=-=
                                                                        ;           WHICH FOLLOWS W/ 767            <=
026612  012742  000636                          MOV     #636,-(R2)      ;MOVE TO MAILBOX #  *******  636  *******
026616  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026620  000000                                  HALT                    ;LOC A+4 STORED WRONG VALUE
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 272       TEST PC AS SOURCE IN MODE 7, USING R0
                                        ;*******************************************************************************
026622  005212                          TS272:  INC     (R2)            ;UPDATE TEST NUMBER
026624  022712  000272                          CMP     #272,(R2)       ;SEQUENCE ERROR?
026630  001013                                  BNE     TS273-10        ;BR TO ERROR HALT ON SEQ ERROR
026632  012737  026100  026104                  MOV     #A,@#A+4        ;LOC A+4 STORES ADDR A
026640  012700  026100                          MOV     #A,R0           ;R0 STORES ADDR A
026644  010770  000004                  PCN3:   MOV     PC,@4(R0)       ;EFFECTIVE ADDR IS A
026650  022737  026650  026100                  CMP     #PCN3+4,@#A     ;LOC A STORES PC+4?
026656  001404                                  BEQ     TS273
```

```
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                                  ;           CONDITIONA  BRANCH INST. AND   <==
                                                                  ;           REPLACE     MOVE INSTRUCTION   <==
                                                                  ;           WHICH FO    W/ 764             <====
026660  012742  000637                  MOV     #637,-(R2)        ;MOVE TO MAILBOX #      ***  637  *******
026664  005242                          INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
026666  000000                          HALT                      ;LOC A STORED WRONG VALUE
                                                                  ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 273       TEST PC AS SOURCE IN RELATIVE DEFERRED MODE ,USING R0
                                ;*******************************************************************************
026670  005212                  TS273:  INC     (R2)              ;UPDATE TEST NUMBER
026672  022712  000273                  CMP     #273,(R2)         ;SEQUENCE ERROR?
026676  001011                          BNE     TS274-10          ;BR TO ERROR HALT ON SEQ ERROR
026700  012737  026102  026100          MOV     #A+2,@#A          ;LOC A STORES ADDR A+2
026706  010777  177166          PCN4:   MOV     PC,@A             ;EFFECTIVE ADDR IS A+2
026712  022737  026712  026102          CMP     #PCN4+4,@#A+2     ;LOC A+2 STORES PC+4?
026720  001404                          BEQ     TS274
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                  ;           CONDITIONAL BRANCH INST. AND   <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                  ;           WHICH FOLLOWS W/ 766           <====
026722  012742  000640                  MOV     #640,-(R2)        ;MOVE TO MAILBOX #  *******  640  *******
026726  005242                          INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
026730  000000                          HALT                      ;LOC A+2 STORED WRONG VALUE
                                                                  ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 274       TEST PC AS SOURCE IN RELATIVE MODE ,USING R0
                                ;*******************************************************************************
026732  005212                  TS274:  INC     (R2)              ;UPDATE TEST NUMBER
026734  022712  000274                  CMP     #274,(R2)         ;SEQUENCE ERROR?
026740  001010                          BNE     TS275-10          ;BR TO ERROR HALT ON SEQ ERROR
026742  005037  026100                  CLR     @#A               ;CLEAR A
026746  010767  177126          PCN5:   MOV     PC,A              ;EFFECTIVE ADDR IS A
026752  022737  026752  026100          CMP     #PCN5+4,@#A       ;LOC A STORES PC+4?
026760  001404                          BEQ     TS275
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                  ;           CONDITIONAL BRANCH INST. AND   <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION   <===
                                                                  ;           WHICH FOLLOWS W/ 767           <---
026762  012742  000641                  MOV     #641,-(R2)        ;MOVE TO MAILBOX #  *******  641  *******
026766  005242                          INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
026770  000000                          HALT                      ;LOCATION A STORED WRONG VALUE
                                                                  ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                .SBTTL  THE NEXT THREE TESTS EXERCISE MASKING ACTION OF MICROCODES.
                                ;*******************************************************************************
                                ;TEST 275       TEST SUB INSTRUCTION, SM=0, DM=2
                                ;*******************************************************************************
026772  005212                  TS275:  INC     (R2)              ;UPDATE TEST NUMBER
026774  022712  000275                  CMP     #275,(R2)         ;SEQUENCE ERROR?
027000  001013                          BNE     TS276-10          ;BR TO ERROR HALT ON SEQ ERROR
027002  012737  052525  000000          MOV     #052525,@#0       ;SET UP LOC 0
```

```
027010  012701  050505                  MOV     #050505,R1          ;SET UP R1
027014  005000                          CLR     R0                  ;CLEAR R0
027016  160120                          SUB     R1,(R0)+            ;SUBTRACTION, SM=0,DM=2
027020  022737  002020  000000          CMP     #2020,@#0           ;CHECK DIFFERENCE AT LOC 0
027026  001404                          BEQ     TS276
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                    ;           CONDITIONAL BRANCH INST. AND   <--
                                                                    ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                    ;           WHICH FOLLOWS W/ 764           <--
027030  012742  000642                  MOV     #642,-(R2)          ;MOVE TO MAILBOX #  *******  642  *******
027034  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027036  000000                          HALT                        ;WRONG RESULT FROM SUBTRACTION
                                                                    ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 276       TEST MFPD WITH R0, IN MODE 2
                                ;*******************************************************************************
027040  005212                  TS276:  INC     (R2)                ;UPDATE TEST NUMBER
027042  022712  000276                  CMP     #276,(R2)           ;SEQUENCE ERROR?
027046  001020                          BNE     TS277-10            ;BR TO ERROR HALT ON SEQ ERROR
027050  012737  052525  000000          MOV     #052525,@#0         ;SET UP LOC 0
027056  005000                          CLR     R0                  ;CLEAR R0
027060  012767  170000  150710          MOV     #170000,PS          ;SET USER MODE ON, CURRENT & PREVIOUS
027066  012706  027324                  MOV     #USTBOT,R6          ;SET USER STACK POINTER
027072  106520                          MFPD    (R0)+               ;MODE 2, MFPD
027074  005067  150676                  CLR     PS                  ;SET KERNEL MODE
027100  022767  052525  000214          CMP     #052525,USTBOT-2            ;CHECK DATA ON STACK
027106  001404                          BEQ     BRMFPD              ;BR IF NO ERROR
027110  012742  000643                  MOV     #643,-(R2)          ;MOVE TO MAILBOX #  *******  643  *******
027114  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027116  000000                          HALT                        ;INCORRECT DATA FROM MFPD
027120                          BRMFPD:

                                ;*******************************************************************************
                                ;TEST 277       TEST MTPD WITH R0, IN MODE 2
                                ;*******************************************************************************
027120  005212                  TS277:  INC     (R2)                ;UPDATE TEST NUMBER
027122  022712  000277                  CMP     #277,(R2)           ;SEQUENCE ERROR?
027126  001026                          BNE     END1                ;BR TO ERROR HALT ON SEQ ERROR
027130  012767  170000  150640          MOV     #170000,PS          ;SET USER MODE ON, CURRENT & PREVIOUS
027136  012706  027324                  MOV     #USTBOT,R6          ;SET USER STACK POINTER
027142  012746  125252                  MOV     #125252,-(R6)       ;PUSH DATA IN USER STACK
027146  012737  000000  000000          MOV     #0,@#0              ;CLEAR LOC 0
027154  005000                          CLR     R0                  ;CLEAR R0
027156  106620                          MTPD    (R0)+               ;MODE 2, MTPD
027160  005067  150612                  CLR     PS                  ;SET KERNEL MODE
027164  022737  125252  000000          CMP     #125252,@#0         ;CHECK DATA ON LOC 0
027172  001514                          BEQ     SECPRT              ;BR TO TRAP TEST IF NO ERROR
027174  012742  000644                  MOV     #644,-(R2)          ;MOVE TO MAILBOX #  *******  644  *******
027200  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027202  000000                          HALT                        ;INCORRECT DATA FROM MTPD
027204                          END1:
027204  012742  000645                  MOV     #645,-(R2)          ;MOVE TO MAILBOX #  *******  645  *******
027210  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027212  000000                          HALT                        ;SEQUENCE ERROR
```

```
027214  000402                BRTAB:  BR      .+6
027216  001002                        BNE     .+6
027220  001402                        BEQ     .+6
027222  002002                        BGE     .+6
027224  002402                        BLT     .+6
027226  003002                        BGT     .+6
027230  003402                        BLE     .+6
027232  100002                        BPL     .+6
027234  100402                        BMI     .+6
027236  101002                        BHI     .+6
027240  101402                        BLOS    .+6
027242  102002                        BVC     .+6
027244  102402                        BVS     .+6
027246  103002                        BCC     .+6             ;SAME AS BHIS
027250  103402                        BCS     .+6             ;SAME AS BLO

        000002                .RADIX  2
027252  177777                YNTAB:  1111111111111111        ;BR
027254  170360                        1111000011110000        ;BNE:  Z=0
027256  007417                        0000111100001111        ;BEQ:  Z=1
027260  146063                        1100110000110011        ;BGE:  N XOR V -0
027262  031714                        0011001111001100        ;BLT:  N XOR V -1
027264  140060                        1100000000110000        ;BGT:  Z+(N XOR V) =0
027266  037717                        0011111111001111        ;BLE:  Z+(N XOR V) -1

027270  177400                        1111111100000000        ;BPL:  N-0
027272  000377                        0000000011111111        ;BMI:  N-1
027274  120240                        1010000010100000        ;BHI:  C+Z-0
027276  057537                        0101111101011111        ;BLOS: C+Z=1
027300  146314                        1100110011001100        ;BVC:  V=0
027302  031463                        0011001100110011        ;BVS:  V=1
027304  125252                        1010101010101010        ;BCC:  C=0
027306  052525                        0101010101010101        ;BCS:  C-1
        000010                .RADIX  8

                              .EVEN
027310  000006                .BLKW   6
027324                        USTBOT:
                              ;*******************************************************************
                              ; THE FOLLOWING ARE SPECIAL CPU TRAP
                              ;HANDLERS TO TRAP AND REPORT SPECIAL TRAPS.
                              ;
                              ;*******************************************************************

027324                        T04:
027324  012742  000646                MOV     #646,-(R2)      ;MOVE TO MAILBOX #  *******  646  *******
027330  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027332  000000                        HALT                    ;TRAPPED THRU LOC. 4
027334                        T010:
027334  012742  000647                MOV     #647,-(R2)      ;MOVE TO MAILBOX #  *******  647  *******
027340  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027342  000000                        HALT                    ;TRAPPED THRU LOC. 10
027344                        T014:
027344  012742  000650                MOV     #650,-(R2)      ;MOVE TO MAILBOX #  *******  650  *******
027350  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
027352  000000                          HALT                        ;TRAPPED THRU LOC. 14
027354                          T030:
027354  012742  000651                  MOV     #651,-(R2)          ;MOVE TO MAILBOX #  *******  651  *******
027360  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027362  000000                          HALT                        ;TRAPPED THRU LOC. 30
027364                          T034:
027364  012742  000652                  MOV     #652,-(R2)          ;MOVE TO MAILBOX #  *******  652  *******
027370  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027372  000000                          HALT                        ;TRAPPED THRU LOC. 34
027374                          T0114:
027374  012742  000653                  MOV     #653,-(R2)          ;MOVE TO MAILBOX #  *******  653  *******
027400  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027402  000000                          HALT                        ;TRAPPED THRU LOC. 114
027404                          T0244:
027404  012742  000654                  MOV     #654,-(R2)          ;MOVE TO MAILBOX #  *******  654  *******
027410  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027412  000000                          HALT                        ;TRAPPED THRU LOC. 244
027414                          T0250:
027414  012742  000655                  MOV     #655,-(R2)          ;MOVE TO MAILBOX #  *******  655  *******
027420  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027422  000000                          HALT                        ;TRAPPED THRU LOC. 250
                                .SBTTL ** STARTING OF TRAP TEST **
027424                          SECPRT:
```

```
                                .REPT 0
000000

                                PART TWO:               F11 TRAP TEST, THIS IS THE SECOND
                                                        PART OF THE MAIN PROGRAM.


                                ABSTRACT

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

                                .ENDR

                                .LIST ME
                                .NLIST MC,MD,CND
                                .ABS
000006                          SP=%6
000006                          R6=%6
000003                          TAB=%3
000001                          LAST=%1
000005                          FIRST=%5
000002                          R2=%2
000000                          HLT=HALT
000003                          TRT=3
000004                          ITRAP5=4
000004                          RTRAP5=4                ;RESERVED INST AND ILLEGAL ADDRESSES
000014                          RTRAP4=14               ;FOR TRACE TRAP
000030                          RTRAP3=30               ;FOR EMULATOR TRAP
000020                          RTRAP2=20               ;FOR IOT TRAP
000034                          RTRAP1=34               ;FOR TRAP INST
177564                          TTCSR=177564
177560                          TRCSR=177560
177564                          TPS=177564
177566                          TPB=177566
000240                          BELL=240
000240                          NOP=240
177776                          STATUS=177776
000077                          TRAPA=77
000010                          RTRAP=10
004700                          ILLA=004700
000100                          ILLB=100
177776                          CC=177776
001000                          BUFF=STBOT
```

```
                                        ;SPECIAL CASE OF ODD;.EVEN .BYTE AND REGISTER 6
        000000                          HERE=0

027424  000167  000026                          JMP     TESTN1
027430  000000                          K1:     0
027432  000000                          K2:     0
027434  000000                          K3:     0
027436  000000                          K4:     0
027440  000000                          K5:     0
027442  000000                          K6:     0
027444  052525                          K7:     052525
027446  052400                          K10:    052400
027450  000000                          K11:    0
027452  000000                          K12:    0
027454  000176                          SWR:    176

027456  012767  000176  177770          TESTN1: MOV     #176,SWR        ;POINT TO LOC 176 AS SOFTWARE SWITCH REGISTER
027464  032737  000001  000320                  BIT     #1,@#$ENV       ;ARE WE RUNNING IN APT MODE
027472  001403                                  BEQ     1$              ;IF NO USE SOFTWARE SWITCH REGISTER
027474  012767  000322  177752                  MOV     #$SWREG,SWR     ;IF YES USE APT SWITCH REGISTER
027502  032777  000001  177744          1$:     BIT     #1,@SWR         ;IF BIT IS NON-ZERO SHIP ALL TRAPS TESTS
027510  001402                                  BEQ     2$
027512  000167  013006                          JMP     THRPRT
027516                                  2$:
                                        ;*******************************************************************************
                                        ;TEST 300       TEST AUTO INCREMENT AND DECREMENT OF R6 FOR WORD AND BYTES
                                        ;*******************************************************************************
027516  005212                          TS300:  INC     (R2)            ;UPDATE TEST NUMBER
027520  022712  000300                          CMP     #300,(R2)       ;SEQUENCE ERROR?
027524  001127                                  BNE     TS301-10        ;BR TO ERROR HALT ON SEQ ERROR
027526  005006                                  CLR     %6
027530  112667  150244                          MOVB    (6)+,HERE       ;SIX SHOULD INCREMENT BY TWO
027534  020627  000002                          CMP     %6,#2
027540  001404                                  BEQ     BR1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                        ;           CONDITIONAL BRANCH INST. AND   <----
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                        ;           WHICH FOLLOWS W/ 771           <----
027542  012742  000656                          MOV     #656,-(R2)      ;MOVE TO MAILBOX #  *******  656  *******
027546  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027550  000000                                  HALT                    ;R6 DID NOT AUTO INCREMENT BY TWO

027552  012706  001000                  BR1:    MOV     #1000,%6
027556  114627  000000                          MOVB    -(6),#HERE      ;SHOULD DECREMENT BY TWO
027562  020627  000776                          CMP     %6,#776
027566  001404                                  BEQ     BR2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                        ;           CONDITIONAL BRANCH INST. AND   <----
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                        ;           WHICH FOLLOWS W/ 756           <----
027570  012742  000657                          MOV     #657,-(R2)      ;MOVE TO MAILBOX #  *******  657  *******
027574  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027576  000000                                  HALT                    ;R6 DID NOT AUTO DECREMENT BY 2

027600  005006                          BR2:    CLR     %6
```

```
027602  112626                          MOVB    (6)+,(6)+       ;DOUBLES AUTO INCREMENT OF R6
027604  020627  000004                  CMP     %6,#4
027610  001404                          BEQ     BR3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <---
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 745           <--
027612  012742  000660                  MOV     #660,-(R2)      ;MOVE TO MAILBOX #  *******  660  *******
027616  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027620  000000                          HALT                    ;WRONG AUTO INCREMENT OF R6

027622  005006                  BR3:    CLR     %6
027624  005004                          CLR     %4
027626  122624                          CMPB    (6)+,(4)+       ;TEST INCREMENT OF R6
027630  020627  000002                  CMP     %6,#2
027634  001404                          BEQ     BR4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 733           <
027636  012742  000661                  MOV     #661,-(R2)      ;MOVE TO MAILBOX #  *******  661  *******
027642  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027644  000000                          HALT                    ;WRONG INCREMENT OF R6

027646  005006                  BR4:    CLR     %6
027650  005004                          CLR     %4
027652  122426                          CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
027654  020627  000002                  CMP     %6,#2
027660  001404                          BEQ     BR5
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 721           <-
027662  012742  000662                  MOV     #662,-(R2)      ;MOVE TO MAILBOX #  *******  662  *******
027666  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027670  000000                          HALT                    ;WRONG INCREMENT OF R6

027672  005006                  BR5:    CLR     %6
027674  005004                          CLR     %4
027676  122624                          CMPB    (6)+,(4)+       ;TEST INCREMENT OF R4
027700  020427  000001                  CMP     %4,#1
027704  001404                          BEQ     BR6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <---
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 707           <--
027706  012742  000663                  MOV     #663,-(R2)      ;MOVE  MAILBOX #  *******  663  *******
027712  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027714  000000                          HALT                    ;WRONG INCREMENT OF R4
027716  005006                  BR6:    CLR     %6
027720  005004                          CLR     %4
027722  122426                          CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
027724  020627  000002                  CMP     %6,#2
027730  001404                          BEQ     BR7
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
```

```
                                                        ;            REPLACE THE MOVE INSTRUCTION   <====
                                                        ;            WHICH FOLLOWS W/ 675           <====
027732  012742  000664          MOV     #664,-(R2)      ;MOVE TO MAILBOX #  *******  664  *******
027736  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027740  000000                  HALT                    ;WRONG INCREMENT OF R6

027742  005006          BR7:    CLR     %6
027744  005004                  CLR     %4
027746  122426                  CMPB    (4)+,(6)+       ;TEST INCREMENT OF R4
027750  020427  000001          CMP     %4,#1
027754  001404                  BEQ     BR10
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;            CONDITIONAL BRANCH INST. AND   <====
                                                        ;            REPLACE THE MOVE INSTRUCTION   <====
                                                        ;            WHICH FOLLOWS W/ 663           <====
027756  012742  000665          MOV     #665,-(R2)      ;MOVE TO MAILBOX #  *******  665  *******
027762  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027764  000000                  HALT                    ;WRONG INCREMENT OF R4

027766  012706  001000  BR10:   MOV     #1000,%6
027772  124627  000000          CMPB    -(6),#HERE      ;TEST DECREMENT OF R6
027776  022706  000776          CMP     #776,%6
030002  001404                  BEQ     TS301
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;            CONDITIONAL BRANCH INST. AND   <====
                                                        ;            REPLACE THE MOVE INSTRUCTION   <====
                                                        ;            WHICH FOLLOWS W/ 650           <====
030004  012742  000666          MOV     #666,-(R2)      ;MOVE TO MAILBOX #  *******  666  *******
030010  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030012  000000                  HALT                    ;WRONG DECREMENT OF R6,OR WRONG $TSTNM
                                                        ;  OR SEQUENCE ERROR
                        ;*******************************************************************************
                        ;TEST 301       TEST TRANSFER OF .BYTE USING R6
                        ;*******************************************************************************
                        ;
030014  005212          TS301:  INC     (R2)            ;UPDATE TEST NUMBER
030016  022712  000301          CMP     #301,(R2)       ;SEQUENCE ERROR?
030022  001133                  BNE     TS302-10        ;BR TO ERROR HALT ON SEQ ERROR
030024  012767  123456  177406  MOV     #123456,K5
030032  012767  050505  177370  MOV     #050505,K1
030040  012705  027430          MOV     #K1,%5          ;%5=(050505)K1
030044  012706  027440          MOV     #K5,%6          ;%6=(123456)K5
030050  112625                  MOVB    (6)+,(5)+       ;LOW .BYTE OF R6 TO R5
030052  022767  050456  177350  CMP     #050456,K1
030060  001404                  BEQ     BR11
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                        ;            CONDITIONAL BRANCH INST. AND   <=--
                                                        ;            REPLACE THE MOVE INSTRUCTION   <
                                                        ;            WHICH FOLLOWS W/ 760           <--
030062  012742  000667          MOV     #667,-(R2)      ;MOVE TO MAILBOX #  *******  667  *******
030066  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030070  000000                  HALT                    ;FALSE TRANSFER OF .BYTE

030072  012767  123456  177340  BR11:   MOV     #123456,K5
030100  012767  050505  177322          MOV     #050505,K1
030106  012705  027430          MOV     #K1,%5          ;%5(050505)K1
030112  012706  027442          MOV     #K6,%6          ;%6(123456)K5
```

```
030116  114625                          MOVB    -(6),(5)+       ;LOW .BYTE OF R6 TO R5 (DECREMENT)
030120  026727  177304  050456          CMP     K1,#050456
030126  001404                          BEQ     BR12
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 735            <
030130  012742  000670                  MOV     #670,-(R2)      ;MOVE TO MAILBOX #  *******  670  *******
030134  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030136  000000                          HALT                    ;FALSE R6 .BYTE TRANSFER

030140  012767  123456  177262  BR12:   MOV     #123456,K1
030146  012767  050505  177264          MOV     #050505,K5
030154  012705  027430                  MOV     #K1,%5          ;(123456)
030160  012706  027440                  MOV     #K5,%6          ;(050505)
030164  112526                          MOVB    (5)+,(6)+       ;LOW OF R5 TO LOW OF R6
030166  022767  050456  177244          CMP     #050456,K5
030174  001404                          BEQ     BR13
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                                ;           CONDITIONAL BRANCH INST. AND    <-=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <==
                                                                ;           WHICH FOLLOWS W/ 712            <=-
030176  012742  000671                  MOV     #671,-(R2)      ;MOVE TO MAILBOX #  *******  671  *******
030202  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030204  000000                          HALT                    ;FALSE R6 .BYTE TRANSFER

030206  012767  123456  177214  BR13:   MOV     #123456,K1
030214  012767  050505  177216          MOV     #050505,K5
030222  012705  027431                  MOV     #K1+1,%5        ;123456
030226  012706  027440                  MOV     #K5,%6          ;050505
030232  112526                          MOVB    (5)+,(6)+       ;HIGH OF R5 TO LOW OF R6
030234  026727  177200  050647          CMP     K5,#050647
030242  001404                          BEQ     BR14
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-  -
                                                                ;           CONDITIONAL BRANCH INST. AND    <-=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <  -
                                                                ;           WHICH FOLLOWS W/ 667            <  -
030244  012742  000672                  MOV     #672,-(R2)      ;MOVE TO MAILBOX #  *******  672  *******
030250  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030252  000000                          HALT                    ;FALSE R6 .BYTE TRANSFER

030254  012767  123456  177146  BR14:   MOV     #123456,K1
030262  012767  050505  177150          MOV     #050505,K5
030270  012705  027431                  MOV     #K1+1,%5        ;R5-123456-ODD ADDRESS
030274  012706  027440                  MOV     #K5,%6          ;R6-050505--.EVEN ADDRESS
030300  112625                          MOVB    (6)+,(5)+       ;LOW OF R6 TO HIGH OF R5
030302  022767  042456  177120          CMP     #042456,K1
030310  001404                          BEQ     TS302
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=-=
                                                                ;           CONDITIONAL BRANCH INST. AND    <=-==
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=-=
                                                                ;           WHICH FOLLOWS W/ 644            <=-==
030312  012742  000673                  MOV     #673,-(R2)      ;MOVE TO MAILBOX #  *******  673  *******
030316  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030320  000000                          HALT                    ;FAILED LOW OF 6 TO HIGH OF 5,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;TEST 302       TEST BYTE OPERATION WITH SEQUENTIAL ODD-EVEN ADDRESS
                                        ;*******************************************************************************
030322  005212                          TS302:  INC     (R2)            ;UPDATE TEST NUMBER
030324  022712  000302                          CMP     #302,(R2)       ;SEQUENCE ERROR?
030330  001074                                  BNE     TS303-10        ;BR TO ERROR HALT ON SEQ ERROR
030332  126767  177106  177105                  CMPB    K7,K7+1         ;SAME .WORD LOW TO HIGH
030340  001404                                  BEQ     BR15
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 773            <====
030342  012742  000674                          MOV     #674,-(R2)      ;MOVE TO MAILBOX #  *******  674  *******
030346  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030350  000000                                  HALT                    ;SHOULD COMPARE LOW TO HIGH

030352  126767  177067  177064          BR15:   CMPB    K7+1,K7         ;COMPARE ODD TO .EVEN SAME .WORD
030360  001404                                  BEQ     BR16
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 763            <====
030362  012742  000675                          MOV     #675,-(R2)      ;MOVE TO MAILBOX #  *******  675  *******
030366  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030370  000000                                  HALT                    ;ODD TO .EVEN .BYTE FAILURE

030372  126767  177051  177044          BR16:   CMPB    K10+1,K7        ;SEQUENTIAL .BYTES
030400  001404                                  BEQ     BR17
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 753            <====
030402  012742  000676                          MOV     #676,-(R2)      ;MOVE TO MAILBOX #  *******  676  *******
030406  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030410  000000                                  HALT                    ;ODD TO .EVEN FAILED

030412  126767  177030  177022          BR17:   CMPB    K10,K6
030420  001404                                  BEQ     BR20
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 743            <====
030422  012742  000677                          MOV     #677,-(R2)      ;MOVE TO MAILBOX #  *******  677  *******
030426  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030430  000000                                  HALT                    ;.EVEN TO EVEN FAILED
030432  126767  177007  177007          BR20:   CMPB    K7+1,K10+1
030440  001404                                  BEQ     BR21
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 733            <====
030442  012742  000700                          MOV     #700,-(R2)      ;MOVE TO MAILBOX #  *******  700  *******
030446  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030450  000000                                  HALT                    ;ODD TO ODD FAILED

030452  126767  176770  176767          BR21:   CMPB    K10,K10+1
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030460  001004                          BNE     BR22
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 723            <====
030462  012742  000701                  MOV     #701,-(R2)      ;MOVE TO MAILBOX #  *******  701  *******
030466  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030470  000000                          HALT                    ;LOW TO HIGH IN SAME .WORD FAILED

030472  126767  176751  176747  BR22:   CMPB    K10+1,K10+1
030500  001404                          BEQ     BR23
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 713            <====
030502  012742  000702                  MOV     #702,-(R2)      ;MOVE TO MAILBOX #  *******  702  *******
030506  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030510  000000                          HALT                    ;HIGH TO LOW IN SAME .WORD FAILED

030512  126767  176730  176725  BR23:   CMPB    K10,K7+1
030520  001004                          BNE     TS303
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 703            <====
030522  012742  000703                  MOV     #703,-(R2)      ;MOVE TO MAILBOX #  *******  703  *******
030526  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030530  000000                          HALT                    ;.EVEN TO ODD FAILED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************
                                ;TEST 303       TEST THE CC BITS
                                ;*******************************************************************
030532  005212                  TS303:  INC     (R2)            ;UPDATE TEST NUMBER
030534  022712  000303                  CMP     #303,(R2)       ;SEQUENCE ERROR?
030540  001053                          BNE     TS304-10        ;BR TO ERROR HALT ON SEQ ERROR
030542  000277                          SCC                     ;SET STATUS
030544  005067  147226                  CLR     STATUS          ;CLEAR STATUS
030550  103004                          BCC     BR33
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 773            <====
030552  012742  000704                  MOV     #704,-(R2)      ;MOVE TO MAILBOX #  *******  704  *******
030556  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030560  000000                          HALT                    ;C NOT CLEAR
030562                          BR33:
030562  102004                          BVC     BR34
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 766            <====
030564  012742  000705                  MOV     #705,-(R2)      ;MOVE TO MAILBOX #  *******  705  *******
030570  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030572  000000                          HALT                    ;V NOT CLEAR
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030574                          BR34:
030574  001004                          BNE     BR35
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <---
                                                        ;           CONDITIONAL BRANCH INST. AND    <---
                                                        ;           REPLACE THE MOVE INSTRUCTION    <---
                                                        ;           WHICH FOLLOWS W/ 761            <---
030576  012742  000706                  MOV     #706,-(R2)      ;MOVE TO MAILBOX #  *******  706  *******
030602  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030604  000000                          HALT                    ;Z NOT CLEAR
030606                          BR35:
030606  100004                          BPL     BR36
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <----
                                                        ;           CONDITIONAL BRANCH INST. AND    <---
                                                        ;           REPLACE THE MOVE INSTRUCTION    <----
                                                        ;           WHICH FOLLOWS W/ 754            <----
030610  012742  000707                  MOV     #707,-(R2)      ;MOVE TO MAILBOX #  *******  707  *******
030614  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030616  000000                          HALT                    ;N NOT CLEAR
030620  000257                  BR36:   CCC                     ;CLEAR CONDITION CODES
030622  052767  000017  147146          BIS     #17,STATUS      ;SET STATUS TO ONES

030630  103404                          BCS     BR37
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 743            <====
030632  012742  000710                  MOV     #710,-(R2)      ;MOVE TO MAILBOX #  *******  710  *******
030636  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030640  000000                          HALT                    ;C NOT SET
030642                          BR37:
030642  102404                          BVS     BR40
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 736            <---=
030644  012742  000711                  MOV     #711,-(R2)      ;MOVE TO MAILBOX #  *******  711  *******
030650  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030652  000000                          HALT                    ;V NOT SET
030654                          BR40:
030654  001404                          BEQ     BR41
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <   -
                                                        ;           CONDITIONAL BRANCH INST. AND    <=
                                                        ;           REPLACE THE MOVE INSTRUCTION    <  -
                                                        ;           WHICH FOLLOWS W/ 731            <
030656  012742  000712                  MOV     #712,-(R2)      ;MOVE TO MAILBOX #  *******  712  *******
030662  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030664  000000                          HALT                    ;Z NOT SET
030666                          BR41:
030666  100404                          BMI     TS304
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                        ;           CONDITIONAL BRANCH INST. AND    <
                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                        ;           WHICH FOLLOWS W/ 724            <
030670  012742  000713                  MOV     #713,-(R2)      ;MOVE TO MAILBOX #  *******  713  *******
030674  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030676  000000                          HALT                    ;N NOT SET,OR WRONG $TSTNM
```

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                                                        ;  OP SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 304       TEST THAT A TRAP OCCURS ON A RESERVED INSTRUCTION
                                ;*******************************************************************
030700  005212                  TS304:  INC     (R2)            ;UPDATE TEST NUMBER
030702  022712  000304                  CMP     #304,(R2)       ;SEQUENCE ERROR?
030706  001006                          BNE     RETA            ;BR TO ERROR HALT ON SEQ ERROR
030710  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
030714  012767  030734  147066          MOV     #RETAH,RTRAP    ;RETURN LOCATION
030722  000077                          TRAPA                   ;RESERVED INSTRUCTION, SHOULD TRAP
030724                          RETA:
030724  012742  000714                  MOV     #714,-(R2)      ;MOVE TO MAILBOX #  *******  714  *******
030730  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030732  000000                          HALT                    ;RESERVE INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
030734                          RETAH:
                                ;*******************************************************************
                                ;TEST 305       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************
030734  005212                  TS305:  INC     (R2)            ;UPDATE TEST NUMBER
030736  022712  000305                  CMP     #305,(R2)       ;SEQUENCE ERROR?
030742  001011                          BNE     TS306-10        ;BR TO ERROR HALT ON SEQ ERROR
030744  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
030750  012767  030760  147032          MOV     #RETB,RTRAP     ;RETURN POINTER
030756  000077                          TRAPA                   ;RESERVED INSTRUCTION
030760  020627  000774          RETB:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
030764  001404                          BEQ     TS306
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <-  -
                                                        ;           REPLACE THE MOVE INSTRUCTION   < - -
                                                        ;           WHICH FOLLOWS W/ 766           <   -
030766  012742  000715                  MOV     #715,-(R2)      ;MOVE TO MAILBOX #  *******  715  *******
030772  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030774  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                        ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 306       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************
030776  005212                  TS306:  INC     (R2)            ;UPDATE TEST NUMBER
031000  022712  000306                  CMP     #306,(R2)       ;SEQUENCE ERROR?
031004  001012                          BNE     TS307-10        ;BR TO ERROR HALT ON SEQ ERROR
031006  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
031012  012767  031022  146770          MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
031020  000077                  INSTC:  TRAPA                   ;TRAP ON THIS INSTRUCTION
031022  022767  031022  147744  RETC:   CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
031030  001404                          BEQ     TS307
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   < - -
                                                        ;           CONDITIONAL BRANCH INST. AND   <-- =
                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                        ;           WHICH FOLLOWS W/ 765           <-
031032  012742  000716                  MOV     #716,-(R2)      ;MOVE TO MAILBOX #  *******  716  *******
031036  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031040  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                        ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 307       TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************
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031042  005212                  TS307:  INC     (R2)            ;UPDATE TEST NUMBER
031044  022712  000307                  CMP     #307,(R2)       ;SEQUENCE ERROR?
031050  001037                          BNE     TS310-10        ;BR TO ERROR HALT ON SEQ ERROR
031052  012706  001000                  MOV     #BUFF,SP        ;SET UP
031056  012767  031074  146724          MOV     #RETD,RTRAP     ;SET UP
031064  005067  146706                  CLR     CC              ;CLEAR CC AND PRIORITY
031070  000257                          CCC
031072  000077                          TRAPA                   ;TRAP
031074  026727  147676  000000  RETD:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
031102  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                                ;           CONDITIONAL BRANCH INST. AND    <=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 762            <
031104  012742  000717                  MOV     #717,-(R2)      ;MOVE TO MAILBOX #  *******  717  *******
031110  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031112  000000                          HALT                    ;INCORRECT STATUS
031114  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
031120  012767  031140  146662          MOV     #RETE,RTRAP     ;SET UP
031126  012767  000357  146642          MOV     #357,CC         ;SET PRIORITY
031134  000277                          SCC                     ;SET CC
031136  000077                          TRAPA                   ;TRAP
031140  026727  147632  000357  RETE:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
031146  001404                          BEQ     TS310
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 740            <
031150  012742  000720                  MOV     #720,-(R2)      ;MOVE TO MAILBOX #  *******  720  *******
031154  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031156  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 310       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
031160  005212                  TS310:  INC     (R2)            ;UPDATE TEST NUMBER
031162  022712  000310                  CMP     #310,(R2)       ;SEQUENCE ERROR?
031166  001110                          BNE     STPP            ;BR TO ERROR HALT ON SEQ ERROR
031170  012706  001000                  MOV     #BUFF,SP
031174  012767  031210  146606          MOV     #RETF,RTRAP
031202  005067  146604                  CLR     RTRAP+2         ;CLEAR FUTURE PRIORITY AND CC
031206  000077                          TRAPA
031210                          RETF:                           ;TEST FOR "C" CLEARED
031210  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <==-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <--
                                                                ;           WHICH FOLLOWS W/ 766            <-
031212  012742  000721                  MOV     #721,-(R2)      ;MOVE TO MAILBOX #  *******  721  *******
031216  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031220  000000                          HALT                    ;N NOT CLEARED
031222                          1$:
031222  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <- =
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
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                                                                ;            WHICH FOLLOWS W/ 761
031224  012742  000722                  MOV     #722,-(R2)      ;MOVE TO MAILBOX #  *******  722  *******
031230  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031232  000000                          HALT                    ;Z NOT CLEARED
031234                          2$:
031234  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;            CONDITIONAL BRANCH INST. AND
                                                                ;            REPLACE THE MOVE INSTRUCTION
                                                                ;            WHICH FOLLOWS W/ 754
031236  012742  000723                  MOV     #723,-(R2)      ;MOVE TO MAILBOX #  *******  723  *******
031242  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031244  000000                          HALT                    ;V NOT CLEARED
031246                          3$:
031246  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;            CONDITIONAL BRANCH INST. AND
                                                                ;            REPLACE THE MOVE INSTRUCTION
                                                                ;            WHICH FOLLOWS W/ 747
031250  012742  000724                  MOV     #724,-(R2)      ;MOVE TO MAILBOX #  *******  724  *******
031254  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031256  000000                          HALT                    ;C NOT CLEARED
031260  032767  000340  146510  4$:     BIT     #340,CC         ;TEST PRIORITY
031266  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;            CONDITIONAL BRANCH INST. AND
                                                                ;            REPLACE THE MOVE INSTRUCTION
                                                                ;            WHICH FOLLOWS W/ 737
031270  012742  000725                  MOV     #725,-(R2)      ;MOVE TO MAILBOX #  *******  725  *******
031274  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031276  000000                          HALT                    ;PRIORITY NOT ZERO
031300  012706  001000          5$:     MOV     #BUFF,SP
031304  012767  031322  146476          MOV     #RETG,RTRAP
031312  012767  000357  146472          MOV     #357,RTRAP+2    ;SET NEW "CC" AND PRIORITY
031320  000077                          TRAPA                   ;TRAP HERE
031322                          RETG:
031322  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;            CONDITIONAL BRANCH INST. AND
                                                                ;            REPLACE THE MOVE INSTRUCTION
                                                                ;            WHICH FOLLOWS W/ 721
031324  012742  000726                  MOV     #726,-(R2)      ;MOVE TO MAILBOX #  *******  726  *******
031330  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031332  000000                          HALT                    ;N NOT SET
031334                          1$:
031334  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;            CONDITIONAL BRANCH INST. AND
                                                                ;            REPLACE THE MOVE INSTRUCTION
                                                                ;            WHICH FOLLOWS W/ 714
031336  012742  000727                  MOV     #727,-(R2)      ;MOVE TO MAILBOX #  *******  727  *******
031342  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031344  000000                          HALT                    ;Z NOT SET
031346                          2$:
031346  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

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                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 707           <
031350  012742  000730                  MOV     #730,-(R2)      ;MOVE TO MAILBOX #  *******  730  *******
031354  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031356  000000                          HALT                    ;V NOT SET
031360                          3$:
031360  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 702           <
031362  012742  000731                  MOV     #731,-(R2)      ;MOVE TO MAILBOX #  *******  731  *******
031366  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031370  000000                          HALT                    ;C NOT SET
031372  016706  146400          4$:     MOV     CC,SP
031376  042706  000017                  BIC     #17,SP
031402  022706  000340                  CMP     #340,SP
031406  001404                          BEQ     STPPA
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 667           <
031410                          STPP:
031410  012742  000732                  MOV     #732,-(R2)      ;MOVE TO MAILBOX #  *******  732  *******
031414  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031416  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
031420  012767  000012  146362  STPPA:  MOV     #12,10
031426  005067  146360                  CLR     12
                                ;*******************************************************************
                                ;TEST 311       TEST THAT A TRAP OCCURS FOR A "TRAP" INSTRUCTION
                                ;*******************************************************************
                                TS311:  INC     (R2)            ;UPDATE TEST NUMBER
031432  005212                          CMP     #311,(R2)       ;SEQUENCE ERROR?
031434  022712  000311                  BNE     TS312-10        ;BR TO ERROR HALT ON SEQ ERROR
031440  001013                          MOV     #12,10
031442  012767  000012  146340          CLR     12
031450  005067  146336                  MOV     #BUFF,SP        ;STACK POINTER SETUP
031454  012706  001000                  MOV     #RETA1,RTRAP1   ;RETURN LOCATION
031460  012767  031500  146346          TRAP                    ;RESERVED INSTRUCTION, SHOULD TRAP
031466  104400                          MOV     #733,-(R2)      ;MOVE TO MAILBOX #  *******  733  *******
031470  012742  000733                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031474  005242                          HALT                    ;TRAP DIDN'T TRAP,OR WRONG $TSTNM
031476  000000                  RETA1:
031500                          ;*******************************************************************
                                ;TEST 312       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************
                                TS312:  INC     (R2)            ;UPDATE TEST NUMBER
031500  005212                          CMP     #312,(R2)       ;SEQUENCE ERROR?
031502  022712  000312                  BNE     TS313-10        ;BR TO ERROR HALT ON SEQ ERROR
031506  001011                          MOV     #BUFF,SP        ;STACK POINTER SETUP
031510  012706  001000                  MOV     #RETB1,RTRAP1   ;RETURN POINTER
031514  012767  031524  146312          TRAP                    ;RESERVED INSTRUCTION
031522  104400                  RETB1:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
031524  020627  000774                  BEQ     TS313
031530  001404                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

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                                                        ;           CONDITIONAL BRANCH INST. AND   <-==
                                                        ;           REPLACE THE MOVE INSTRUCTION   <==-
                                                        ;           WHICH FOLLOWS W/ 766           <-=-
031532  012742  000734                  MOV     #734,-(R2)      ;MOVE TO MAILBOX #  *******  734  *******
031536  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031540  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 313       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************************
031542  005212                  TS313:  INC     (R2)            ;UPDATE TEST NUMBER
031544  022712  000313                  CMP     #313,(R2)       ;SEQUENCE ERROR?
031550  001012                          BNE     TS314-10        ;BR TO ERROR HALT ON SEQ ERROR
031552  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
031556  012767  031566  146250          MOV     #RETC1,RTRAP1   ;RETURN FROM TRAP POINTER
031564  104400                          TRAP                    ;TRAP ON THIS INSTRUCTION
031566  022767  031566  147200  RETC1:  CMP     #.,BUFF-4       ;CHECK INCREMENTED P.C.
031574  001404                          BEQ     TS314
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--==
                                                                ;           CONDITIONAL BRANCH INST. AND   <=-=
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---==
                                                                ;           WHICH FOLLOWS W/ 765           <=--=
031576  012742  000735                  MOV     #735,-(R2)      ;MOVE TO MAILBOX #  *******  735  *******
031602  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031604  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 314       TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
031606  005212                  TS314:  INC     (R2)            ;UPDATE TEST NUMBER
031610  022712  000314                  CMP     #314,(R2)       ;SEQUENCE ERROR?
031614  001036                          BNE     TS315-10        ;BR TO ERROR HALT ON SEQ ERROR
031616  012706  001000                  MOV     #BUFF,SP        ;SET UP
031622  012767  031640  146204          MOV     #RETD1,RTRAP1   ;SET UP
031630  005067  146142                  CLR     CC              ;CLEAR CC AND PRIORITY
031634  000257                          CCC
031636  104400                          TRAP                    ;TRAP
031640  026727  147132  000000  RETD1:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
031646  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 762           <
031650  012742  000736                  MOV     #736,-(R2)      ;MOVE TO MAILBOX #  *******  736  *******
031654  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031656  000000                          HALT                    ;INCORRECT STATUS
031660  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
031664  012767  031702  146142          MOV     #RETE1,RTRAP1   ;SET UP
031672  012767  000357  146076          MOV     #357,CC         ;SET PRIORITY
031700  104400                          TRAP                    ;SET CC
031702  026727  147070  000357  RETE1:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
031710  001404                          BEQ     TS315
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 741           <
```

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031712  012742  000737                  MOV     #737,-(R2)      ;MOVE TO MAILBOX #  *******  737  *******
031716  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031720  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 315       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
031722  005212                  TS315:  INC     (R2)            ;UPDATE TEST NUMBER
031724  022712  000315                  CMP     #315,(R2)       ;SEQUENCE ERROR?
031730  001110                          BNE     TS316-10        ;BR TO ERROR HALT ON SEQ ERROR
031732  012706  001000                  MOV     #BUFF,SP
031736  012767  031752  146070          MOV     #RETF1,RTRAP1
031744  005067  146066                  CLR     RTRAP1+2        ;CLEAR FUTURE PRIORITY AND CC
031750  104400                          TRAP
031752                          RETF1:                          ;TEST FOR "C" CLEARED
031752  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <
031754  012742  000740                  MOV     #740,-(R2)      ;MOVE TO MAILBOX #  *******  740  *******
031760  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031762  000000                          HALT                    ;C NOT CLEARED
031764                          1$:
031764  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 761           <
031766  012742  000741                  MOV     #741,-(R2)      ;MOVE TO MAILBOX #  *******  741  *******
031772  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031774  000000                          HALT                    ;Z NOT CLEARED
031776                          2$:
031776  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 754           <
032000  012742  000742                  MOV     #742,-(R2)      ;MOVE TO MAILBOX #  *******  742  *******
032004  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032006  000000                          HALT                    ;V NOT CLEARED
032010                          3$:
032010  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                ;           WHICH FOLLOWS W/ 747           <
032012  012742  000743                  MOV     #743,-(R2)      ;MOVE TO MAILBOX #  *******  743  *******
032016  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032020  000000                          HALT                    ;C NOT CLEARED
032022  032767  000340  145746  4$:     BIT     #340,CC         ;TEST PRIORITY
032030  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 737           <
```

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032032  012742  000744                  MOV     #744,-(R2)      ;MOVE TO MAILBOX #  *******  744  *******
032036  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032040  000000                          HALT                    ;PRIORITY NOT ZERO
032042  012706  001000          5$:     MOV     #BUFF,SP
032046  012767  032064  145760          MOV     #RETG1,RTRAP1
032054  012767  000357  145754          MOV     #357,RTRAP1+2   ;SET NEW "CC" AND PRIORITY
032062  104400                          TRAP                    ;TRAP HERE
032064                          RETG1:
032064  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                ;           CONDITIONAL BRANCH INST. AND   <----
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 721           <----
032066  012742  000745                  MOV     #745,-(R2)      ;MOVE TO MAILBOX #  *******  745  *******
032072  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032074  000000                          HALT                    ;N NOT SET
032076                          1$:
032076  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                ;           CONDITIONAL BRANCH INST. AND   <----
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 714           <----
032100  012742  000746                  MOV     #746,-(R2)      ;MOVE TO MAILBOX #  *******  746  *******
032104  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032106  000000                          HALT                    ;Z NOT SET
032110                          2$:
032110  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                ;           CONDITIONAL BRANCH INST. AND   <----
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 707           <----
032112  012742  000747                  MOV     #747,-(R2)      ;MOVE TO MAILBOX #  *******  747  *******
032116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032120  000000                          HALT                    ;V NOT SET
032122                          3$:
032122  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                ;           CONDITIONAL BRANCH INST. AND   <----
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 702           <----
032124  012742  000750                  MOV     #750,-(R2)      ;MOVE TO MAILBOX #  *******  750  *******
032130  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032132  000000                          HALT                    ;C NOT SET
032134  016706  145636          4$:     MOV     CC,SP
032140  042706  000017                  BIC     #17,SP
032144  022706  000340                  CMP     #340,SP
032150  001404                          BEQ     TS316
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <----
                                                                ;           CONDITIONAL BRANCH INST. AND   <----
                                                                ;           REPLACE THE MOVE INSTRUCTION   <----
                                                                ;           WHICH FOLLOWS W/ 667           <----
032152  012742  000751                  MOV     #751,-(R2)      ;MOVE TO MAILBOX #  *******  751  *******
032156  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032160  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $ISTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
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                                        ;TEST 316       TEST THAT ALL COMBINATION OF ''TRAP'' WILL CAUSE A TRAP
                                        ;*******************************************************************************
032162  005212                          TS316:  INC     (R2)            ;UPDATE TEST NUMBER
032164  022712  000316                          CMP     #316,(R2)       ;SEQUENCE ERROR?
032170  001011                                  BNE     BR45            ;BR TO ERROR HALT ON SEQ ERROR
                                                                        ;***** F11 **** ADD +376 TO SHORTEN TEST
032172  012767  104776  000012                  MOV     #TRAP+376,RB1   ;INITIALIZE BASE TRAP INSTRUCTION
032200  012767  032224  145626                  MOV     #RA1,34         ;RETURN FROM TRAP TO RA1
032206  012706  001000                  RC1:    MOV     #BUFF,SP        ;SET UP STACK POINTER
032212  104400                          RB1:    TRAP                    ;TRAP INST WILL BE MODIFIED TO TRAP+377
032214                                  BR45:
032214  012742  000752                          MOV     #752,-(R2)      ;MOVE TO MAILBOX #  *******  752  *******
032220  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032222  000000                                  HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
032224  005267  177762                  RA1:    INC     RB1             ;INCREMENT TRAP INSTRUCTION
032230  022767  104777  177754                  CMP     #104777,RB1     ;TRAP+377 TO UPPER LIMIT
032236  103363                                  BHIS    RC1             ;HAVE WE TESTED ALL
032240  012767  000036  145566                  MOV     #36,34
032246  005067  145564                          CLR     36
                                        ;*******************************************************************************
                                        ;TEST 317       TEST THAT A TRAP OCCURES ON AN ''IOT'' INSTRUCTION
                                        ;*******************************************************************************
032252  005212                          TS317:  INC     (R2)            ;UPDATE TEST NUMBER
032254  022712  000317                          CMP     #317,(R2)       ;SEQUENCE ERROR?
032260  001006                                  BNE     TS320-10        ;BR TO ERROR HALT ON SEQ ERROR
032262  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
032266  012767  032306  145524                  MOV     #RETA2,RTRAP2   ;RETURN LOCATION
032274  000004                                  IOT                     ;RESERVE INSTRUCTION, SHOULD TRAP
032276  012742  000753                          MOV     #753,-(R2)      ;MOVE TO MAILBOX #  *******  753  *******
032302  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032304  000000                                  HALT                    ;IOT DIDN'T TRAP,OR WRONG $TSTNM
032306                                  RETA2:
                                        ;*******************************************************************************
                                        ;TEST 320       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                        ;*******************************************************************************
032306  005212                          TS320:  INC     (R2)            ;UPDATE TEST NUMBER
032310  022712  000320                          CMP     #320,(R2)       ;SEQUENCE ERROR?
032314  001011                                  BNE     TS321-10        ;BR TO ERROR HALT ON SEQ ERROR
032316  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
032322  012767  032332  145470                  MOV     #RETB2,RTRAP2   ;RETURN POINTER
032330  000004                                  IOT                     ;RESERVED INSTRUCTION
032332  020627  000774                  RETB2:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
032336  001404                                  BEQ     TS321
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <==
                                                                        ;           WHICH FOLLOWS W/ 766           <=
032340  012742  000754                          MOV     #754,-(R2)      ;MOVE TO MAILBOX #  *******  754  *******
032344  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032346  000000                                  HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;TEST 321       TEST THAT PROPER P.C. IS SAVED
                                        ;*******************************************************************************
032350  005212                          TS321:  INC     (R2)            ;UPDATE TEST NUMBER
032352  022712  000321                          CMP     #321,(R2)       ;SEQUENCE ERROR?
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032356  001012                          BNE     TS322-10        ;BR TO ERROR HALT ON SEQ ERROR
032360  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
032364  012767  032374  145426          MOV     #RETC2,RTRAP2   ;RETURN FROM TRAP POINTER
032372  000004                          IOT                     ;TRAP ON THIS INSTRUCTION
032374  022767  032374  146372  RETC2:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
032402  001404                          BEQ     TS322
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 765            <-
032404  012742  000755                  MOV     #755,-(R2)      ;MOVE TO MAILBOX #  *******  755  *******
032410  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032412  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 322       TEST THAT 'OLD' CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
032414  005212                  TS322:  INC     (R2)            ;UPDATE TEST NUMBER
032416  022712  000322                  CMP     #322,(R2)       ;SEQUENCE ERROR?
032422  001037                          BNE     TS323-10        ;BR TO ERROR HALT ON SEQ ERROR
032424  012706  001000                  MOV     #BUFF,SP        ;SET UP
032430  012767  032446  145362          MOV     #RETD2,RTRAP2   ;SET UP
032436  005067  145334                  CLR     CC              ;CLEAR CC AND PRIORITY
032442  000257                          CCC
032444  000004                          IOT                     ;TRAP
032446  026727  146324  000000  RETD2:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
032454  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=
                                                                ;           WHICH FOLLOWS W/ 762            <
032456  012742  000756                  MOV     #756,-(R2)      ;MOVE TO MAILBOX #  *******  756  *******
032462  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032464  000000                          HALT                    ;INCORRECT STATUS
032466  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
032472  012767  032512  145320          MOV     #RETE2,RTRAP2   ;SET UP
032500  012767  000357  145270          MOV     #357,CC         ;SET PRIORITY
032506  000277                          SCC                     ;SET CC
032510  000004                          IOT                     ;TRAP
032512  026727  146260  000357  RETE2:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
032520  001404                          BEQ     TS323
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <  --
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 740            <- -
032522  012742  000757                  MOV     #757,-(R2)      ;MOVE TO MAILBOX #  *******  757  *******
032526  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032530  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 323       TEST THAT 'NEW' STATUS IS CORRECT
                                ;*******************************************************************************
032532  005212                  TS323:  INC     (R2)            ;UPDATE TEST NUMBER
032534  022712  000323                  CMP     #323,(R2)       ;SEQUENCE ERROR?
032540  001110                          BNE     BR46            ;BR TO ERROR HALT ON SEQ ERROR
032542  012706  001000                  MOV     #BUFF,SP
```

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032546  012767  032562  145244          MOV     #RETF2,RTRAP2
032554  005067  145242                  CLR     RTRAP2+2        ;CLEAR FUTURE PRIORITY AND CC
032560  000004                          IOT
032562                          RETF2:                          ;TEST FOR "C" CLEARED
032562  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 766           <====
032564  012742  000760                  MOV     #760,-(R2)      ;MOVE TO MAILBOX #  *******  760  *******
032570  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032572  000000                          HALT                    ;N NOT CLEARED
032574                          1$:
032574  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
032576  012742  000761                  MOV     #761,-(R2)      ;MOVE TO MAILBOX #  *******  761  *******
032602  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032604  000000                          HALT                    ;Z NOT CLEARED
032606                          2$:
032606  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 754           <====
032610  012742  000762                  MOV     #762,-(R2)      ;MOVE TO MAILBOX #  *******  762  *******
032614  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032616  000000                          HALT                    ;V NOT CLEARED
032620                          3$:
032620  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 747           <====
032622  012742  000763                  MOV     #763,-(R2)      ;MOVE TO MAILBOX #  *******  763  *******
032626  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032630  000000                          HALT                    ;C NOT CLEARED
032632  032767  000340  145136  4$:     BIT     #340,CC         ;TEST PRIORITY
032640  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 737           <====
032642  012742  000764                  MOV     #764,-(R2)      ;MOVE TO MAILBOX #  *******  764  *******
032646  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032650  000000                          HALT                    ;PRIORITY NOT ZERO
032652  012706  001000          5$:     MOV     #BUFF,SP
032656  012767  032674  145134          MOV     #RETG2,RTRAP2
032664  012767  000357  145130          MOV     #357,RTRAP2+2   ;SET NEW "CC" AND PRIORITY
032672  000004                          IOT                     ;TRAP HERE
032674                          RETG2:
032674  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
```

```
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 721           <====
032676  012742  000765                  MOV     #765,-(R2)      ;MOVE TO MAILBOX #  *******  765  *******
032702  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032704  000000                          HALT                    ;N NOT SET
032706                          1$:
032706  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 714           <====
032710  012742  000766                  MOV     #766,-(R2)      ;MOVE TO MAILBOX #  *******  766  *******
032714  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032716  000000                          HALT                    ;Z NOT SET
032720                          2$:
032720  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 707           <====
032722  012742  000767                  MOV     #767,-(R2)      ;MOVE TO MAILBOX #  *******  767  *******
032726  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032730  000000                          HALT                    ;V NOT SET
032732                          3$:
032732  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 702           <====
032734  012742  000770                  MOV     #770,-(R2)      ;MOVE TO MAILBOX #  *******  770  *******
032740  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032742  000000                          HALT                    ;C NOT SET
032744  016706  145026          4$:     MOV     CC,SP
032750  042706  000017                  BIC     #17,SP
032754  022706  000340                  CMP     #340,SP
032760  001404                          BEQ     BR46A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 667           <====
032762                          BR46:
032762  012742  000771                  MOV     #771,-(R2)      ;MOVE TO MAILBOX #  *******  771  *******
032766  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032770  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
032772  012767  000022  145020  BR46A:  MOV     #22,20          ;.+2
033000  005067  145016                  CLR     22              ;HALT
                                ;*******************************************************************************
                                ;TEST 324       TEST THAT A TRAP OCCURS ON AN EMT  INSTRUCTION
                                ;*******************************************************************************
033004  005212                  TS324:  INC     (R2)            ;UPDATE TEST NUMBER
033006  022712  000324                  CMP     #324,(R2)       ;SEQUENCE ERROR?
033012  001006                          BNE     TS325-10        ;BR TO ERROR HALT ON SEQ ERROR
033014  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033020  012767  033040  145002          MOV     #RETA3,RTRAP3   ;RETURN LOCATION
033026  104000                          EMT                     ;RESERVE INSTRUCTIOM, SHOULD TRAP
033030  012742  000772                  MOV     #772,-(R2)      ;MOVE TO MAILBOX #  *******  772  *******
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033034  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033036  000000                          HALT                    ;EMT DIDN'T TRAP,OR WRONG $TSTNM
033040                          RETA3:
                                ;*******************************************************************
                                ;TEST 325       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************
033040  005212                  TS325:  INC     (R2)            ;UPDATE TEST NUMBER
033042  022712  000325                  CMP     #325,(R2)       ;SEQUENCE ERROR?
033046  001011                          BNE     TS326-10        ;BR TO ERROR HALT ON SEQ ERROR
033050  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033054  012767  033064  144746          MOV     #RETB3,RTRAP3   ;RETURN POINTER
033062  104000                          EMT                     ;RESERVED INSTRUCTION
033064  020627  000774          RETB3:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
033070  001404                          BEQ     TS326
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
033072  012742  000773                  MOV     #773,-(R2)      ;MOVE TO MAILBOX #  *******  773  *******
033076  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033100  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 326       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************
033102  005212                  TS326:  INC     (R2)            ;UPDATE TEST NUMBER
033104  022712  000326                  CMP     #326,(R2)       ;SEQUENCE ERROR?
033110  001012                          BNE     TS327-10        ;BR TO ERROR HALT ON SEQ ERROR
033112  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033116  012767  033126  144704          MOV     #RETC3,RTRAP3   ;RTURN FROM TRAP POINTER
033124  104000                          EMT                     ;TRAP ON THIS INSTRICTION
033126  022767  033126  145640  RETC3:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
033134  001404                          BEQ     TS327
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-=
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-=
                                                                ;           WHICH FOLLOWS W/ 765            <-
033136  012742  000774                  MOV     #774,-(R2)      ;MOVE TO MAILBOX #  *******  774  *******
033142  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033144  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 327       TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************
033146  005212                  TS327:  INC     (R2)            ;UPDATE TEST NUMBER
033150  022712  000327                  CMP     #327,(R2)       ;SEQUENCE ERROR?
033154  001037                          BNE     TS330-10        ;BR TO ERROR HALT ON SEQ ERROR
033156  012706  001000                  MOV     #BUFF,SP        ;SET UP
033162  012767  033200  144640          MOV     #RETD3,RTRAP3   ;SET UP
033170  005067  144602                  CLR     CC              ;CLEAR CC AND PRIORITY
033174  000257                          CCC
033176  104000                          EMT                     ;TRAP
033200  026727  145572  000000  RETD3:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
033206  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
```

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                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 762
033210  012742  000775                  MOV     #775,-(R2)      ;MOVE TO MAILBOX #  *******  775  *******
033214  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033216  000000                          HALT                    ;INCORRECT STATUS
033220  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
033224  012767  033244  144576          MOV     #RETE3,RTRAP3   ;SET UP
033232  012767  000357  144536          MOV     #357,CC         ;SET PRIORITY
033240  000277                          SCC                     ;SET CC
033242  104000                          EMT                     ;TRAP
033244  026727  145526  000357  RETE3:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
033252  001404                          BEQ     TS330
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 740           <===
033254  012742  000776                  MOV     #776,-(R2)      ;MOVE TO MAILBOX #  *******  776  *******
033260  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033262  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 330       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
033264  005212                  TS330:  INC     (R2)            ;UPDATE TEST NUMBER
033266  022712  000330                  CMP     #330,(R2)       ;SEQUENCE ERROR?
033272  001106                          BNE     TS331-10        ;BR TO ERROR HALT ON SEQ ERROR
033274  012706  001000                  MOV     #BUFF,SP
033300  012767  033314  144522          MOV     #RETF3,RTRAP3
033306  005067  144520                  CLR     RTRAP3+2        ;CLEAR FUTURE PRIORITY AND CC
033312  104000                          EMT
033314                          RETF3:                          ;TEST FOR "C" CLEARED
033314  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 766           <====
033316  012742  000777                  MOV     #777,-(R2)      ;MOVE TO MAILBOX #  *******  777  *******
033322  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033324  000000                          HALT                    ;C NOT CLEARED
033326                          1$:
033326  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
033330  012742  001000                  MOV     #1000,-(R2)     ;MOVE TO MAILBOX #  *******  1000  *******
033334  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033336  000000                          HALT                    ;Z NOT CLEARED
033340                          2$:
033340  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <===
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 754           <====
033342  012742  001001                  MOV     #1001,-(R2)     ;MOVE TO MAILBOX #  *******  1001  *******
033346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

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033350  000000                          HALT                    ;V NOT CLEARED
033352                          3$:
033352  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 747           <====
033354  012742  001002                  MOV     #1002,-(R2)     ;MOVE TO MAILBOX #  *******  1002  *******
033360  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033362  000000                          HALT                    ;C NOT CLEARED
033364  032767  000340  144404  4$:     BIT     #340,CC         ;TEST PRIORITY
033372  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 737           <====
033374  012742  001003                  MOV     #1003,-(R2)     ;MOVE TO MAILBOX #  *******  1003  *******
033400  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033402  000000                          HALT                    ;PRIORITY NOT ZERO
033404  012706  001000          5$:     MOV     #BUFF,SP
033410  012767  033426  144412          MOV     #RETG3,RTRAP3
033416  012767  000357  144406          MOV     #357,RTRAP3+2   ;SET NEW "CC" AND PRIORITY
033424  104000                          EMT                     ;TRAP HERE
033426                          RETG3:
033426  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 721           <====
033430  012742  001004                  MOV     #1004,-(R2)     ;MOVE TO MAILBOX #  *******  1004  *******
033434  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033436  000000                          HALT                    ;N NOT SET
033440                          1$:
033440  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 714           <====
033442  012742  001005                  MOV     #1005,-(R2)     ;MOVE TO MAILBOX #  *******  1005  *******
033446  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033450  000000                          HALT                    ;Z NOT SET
033452                          2$:
033452  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 707           <====
033454  012742  001006                  MOV     #1006,-(R2)     ;MOVE TO MAILBOX #  *******  1006  *******
033460  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033462  000000                          HALT                    ;V NOT SET
033464                          3$:
033464  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 702           <====
```

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033466  012742  001007                  MOV     #1007,-(R2)     ;MOVE TO MAILBOX #  *******  1007  *******
033472  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033474  000000                          HALT                    ;C NOT SET
033476  000257                  4$:     CCC
033500  022767  000340  144270          CMP     #340,CC
033506  001404                          BEQ     TS331
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 671           <--
033510  012742  001010                  MOV     #1010,-(R2)     ;MOVE TO MAILBOX #  *******  1010  *******
033514  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033516  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 331       TEST THAT ALL COMBINATION OF EMT WILL CAUSE A TRAP
                                ;*******************************************************************************
033520  005212                  TS331:  INC     (R2)            ;UPDATE TEST NUMBER
033522  022712  000331                  CMP     #331,(R2)       ;SEQUENCE ERROR?
033526  001011                          BNE     BR47            ;BR TO ERROR HALT ON SEQ ERROR
                                                                ;**** F11 **** ADD +376 TO SHORTEN TEST
033530  012767  104376  000012          MOV     #EMT+376,RB             ;INITIALIZE BASE EMT INSTRUCTION
033536  012767  033562  144264          MOV     #RA,30          ;RETURN FROM TRAP TO RA
033544  012706  001000          RC:     MOV     #BUFF,SP        ;SET UP STACK POINTER
033550  104000                  RB:     EMT                     ;TRAP INST. WILL BE MODIFIED TO EMT+377
033552                          BR47:
033552  012742  001011                  MOV     #1011,-(R2)     ;MOVE TO MAILBOX #  *******  1011  *******
033556  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033560  000000                          HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
033562  005267  177762          RA:     INC     RB              ;INCREMENT TRAP INSTRUCTION
033566  022767  104377  177754          CMP     #104377,RB      ;EMT+377 TO EMT?
033574  103363                          BHIS    RC              ;HAVE WE TESTED ALL
                                                                ;YES
033576  012767  000032  144224          MOV     #32,30          ;/.+
033604  005067  144222                  CLR     32              ;HALT
                                ;*******************************************************************************
                                ;TEST 332       TEST THAT A TRAP OCCURES ON AN 'TRACE-TRT' INSTRUCTION
                                ;*******************************************************************************
033610  005212                  TS332:  INC     (R2)            ;UPDATE TEST NUMBER
033612  022712  000332                  CMP     #332,(R2)       ;SEQUENCE ERROR?
033616  001006                          BNE     TS333-10        ;BR TO ERROR HALT ON SEQ ERROR
033620  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033624  012767  033644  144162          MOV     #RETA4,RTRAP4   ;RETURN LOCATION
033632  000003                          TRT                     ;RESERVED INSTRUCTION, SHOULD TRAP
033634  012742  001012                  MOV     #1012,-(R2)     ;MOVE TO MAILBOX #  *******  1012  *******
033640  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033642  000000                          HALT                    ;TRT DIDN'T TRAP,OR WRONG $TSTNM
033644                          RETA4:
                                ;*******************************************************************************
                                ;TEST 333       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************************
033644  005212                  TS333:  INC     (R2)            ;UPDATE TEST NUMBER
033646  022712  000333                  CMP     #333,(R2)       ;SEQUENCE ERROR?
033652  001011                          BNE     TS334-10        ;BR TO ERROR HALT ON SEQ ERROR
033654  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033660  012767  033670  144126          MOV     #RETB4,RTRAP4   ;RETURN POINTER
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033666  000003                          TRT                     ;RESERVED INSTRUCTION
033670  020627  000774          RETB4:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
033674  001404                          BEQ     TS334
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 766
033676  012742  001013                  MOV     #1013,-(R2)     ;MOVE TO MAILBOX #  *******  1013  *******
033702  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033704  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 334       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************************
033706  005212                  TS334:  INC     (R2)            ;UPDATE TEST NUMBER
033710  022712  000334                  CMP     #334,(R2)       ;SEQUENCE ERROR?
033714  001012                          BNE     TS335-10        ;BR TO ERROR HALT ON SEQ ERROR
033716  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033722  012767  033732  144064          MOV     #RETC4,RTRAP4   ;RETURN FROM TRAP POINTER
033730  000003                          TRT                     ;TRAP ON THIS INSTRUCTION
033732  022767  033732  145034  RETC4:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
033740  001404                          BEQ     TS335
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 765
033742  012742  001014                  MOV     #1014,-(R2)     ;MOVE TO MAILBOX #  *******  1014  *******
033746  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033750  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 335       TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
033752  005212                  TS335:  INC     (R2)            ;UPDATE TEST NUMBER
033754  022712  000335                  CMP     #335,(R2)       ;SEQUENCE ERROR?
033760  001037                          BNE     TS336-10        ;BR TO ERROR HALT ON SEQ ERROR
033762  012706  001000                  MOV     #BUFF,SP        ;SET UP
033766  012767  034004  144020          MOV     #RETD4,RTRAP4   ;SET UP
033774  005067  143776                  CLR     CC              ;CLEAR CC AND PRIORITY
034000  000257                          CCC
034002  000003                          TRT                     ;TRAP
034004  026727  144766  000000  RETD4:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
                                                                ;TEST FOR ALL ZEROS
034012  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
                                                                ;           CONDITIONAL BRANCH INST. AND
                                                                ;           REPLACE THE MOVE INSTRUCTION
                                                                ;           WHICH FOLLOWS W/ 762
034014  012742  001015                  MOV     #1015,-(R2)     ;MOVE TO MAILBOX #  *******  1015  *******
034020  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034022  000000                          HALT                    ;INCORRECT STATUS
034024  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
034030  012767  034050  143756          MOV     #RETE4,RTRAP4   ;SET UP
034036  012767  000357  143732          MOV     #357,CC         ;SET PRIORITY
034044  000277                          SCC                     ;SET-SET CC
034046  000003                          TRT                     ;TRAP
```

```
034050  026727  144722  000357  RETE4:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
034056  001404                          BEQ     TS336
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <=-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 740            <-
034060  012742  001016                  MOV     #1016,-(R2)     ;MOVE TO MAILBOX #  *******  1016  *******
034064  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034066  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 336       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
034070  005212                  TS336:  INC     (R2)            ;UPDATE TEST NUMBER
034072  022712  000336                  CMP     #336,(R2)       ;SEQUENCE ERROR?
034076  001110                          BNE     BR51            ;BR TO ERROR HALT ON SEQ ERROR
034100  012706  001000                  MOV     #BUFF,SP
034104  012767  034120  143702          MOV     #RETF4,RTRAP4
034112  005067  143700                  CLR     RTRAP4+2        ;CLEAR FUTURE PRIORITY AND CC
034116  000003                          TRT
034120                          RETF4:                          ;TEST FOR "C" CLEARED
034120  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 766            <
034122  012742  001017                  MOV     #1017,-(R2)     ;MOVE TO MAILBOX #  *******  1017  *******
034126  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034130  000000                          HALT                    ;C NOT CLEARED
034132                          1$:
034132  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <=-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 761            <-
034134  012742  001020                  MOV     #1020,-(R2)     ;MOVE TO MAILBOX #  *******  1020  *******
034140  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034142  000000                          HALT                    ;Z NOT CLEARED
034144                          2$:
034144  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <-=
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=-
                                                                ;           WHICH FOLLOWS W/ 754            <
034146  012742  001021                  MOV     #1021,-(R2)     ;MOVE TO MAILBOX #  *******  1021  *******
034152  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034154  000000                          HALT                    ;V NOT CLEARED
034156                          3$:
034156  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <--
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 747            <-
034160  012742  001022                  MOV     #1022,-(R2)     ;MOVE TO MAILBOX #  *******  1022  *******
034164  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034166  000000                          HALT                    ;C NOT CLEARED
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034170  032767  000340  143600  4$:     BIT     #340,CC         ;TEST PRIORITY
034176  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 737            <====
034200  012742  001023                  MOV     #1023,-(R2)     ;MOVE TO MAILBOX #  *******  1023  *******
034204  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034206  000000                          HALT                    ;PRIORITY NOT ZERO
034210  012706  001000          5$:     MOV     #BUFF,SP
034214  012767  034232  143572          MOV     #RETG4,RTRAP4
034222  012767  000357  143566          MOV     #357,RTRAP4+2   ;SET NEW "CC" AND PRIORITY
034230  000003                          TRT                     ;TRAP HERE
034232                          RETG4:
034232  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 721            <====
034234  012742  001024                  MOV     #1024,-(R2)     ;MOVE TO MAILBOX #  *******  1024  *******
034240  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034242  000000                          HALT                    ;N NOT SET
034244                          1$:
034244  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 714            <=
034246  012742  001025                  MOV     #1025,-(R2)     ;MOVE TO MAILBOX #  *******  1025  *******
034252  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034254  000000                          HALT                    ;Z NOT SET
034256                          2$:
034256  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 707            <====
034260  012742  001026                  MOV     #1026,-(R2)     ;MOVE TO MAILBOX #  *******  1026  *******
034264  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034266  000000                          HALT                    ;V NOT SET
034270                          3$:
034270  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 702            <=
034272  012742  001027                  MOV     #1027,-(R2)     ;MOVE TO MAILBOX #  *******  1027  *******
034276  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034300  000000                          HALT                    ;C NOT SET
034302  016706  143470          4$:     MOV     CC,SP
034306  042706  000017                  BIC     #17,SP
034312  022706  000340                  CMP     #340,SP
034316  001404                          BEQ     BR51A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <=
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
```

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                                                                ;           WHICH FOLLOWS W/ 667
034320                          BR51:
034320  012742  001030                  MOV     #1030,-(R2)     ;MOVE TO MAILBOX #  *******  1030  *******
034324  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034326  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
034330  012767  000016  143456  BR51A:  MOV     #16,14
034336  005067  143454                  CLR     16

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

                                ;*******************************************************************
                                ;TEST 337       TEST THAT A TRAP OCCURS ON AN ILLEGAL INSTRUCTION
                                ;*******************************************************************
034342  005212                  TS337:  INC     (R2)            ;UPDATE TEST NUMBER
034344  022712  000337                  CMP     #337,(R2)       ;SEQUENCE ERROR?
034350  001006                          BNE     TS340-10        ;BR TO ERROR HALT ON SEQ ERROR
034352  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
034356  012767  034376  143420          MOV     #RETA5,RTRAP5   ;RETURN LOCATION
034364  000100                          JMP     %0              ;ILLEGAL INSTRUCTION, SHOULD TRAP
034366  012742  001031                  MOV     #1031,-(R2)     ;MOVE TO MAILBOX #  *******  1031  *******
034372  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034374  000000                          HALT                    ;ILLEGAL INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
034376                          RETA5:
                                ;*******************************************************************
                                ;TEST 340       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************
034376  005212                  TS340:  INC     (R2)            ;UPDATE TEST NUMBER
034400  022712  000340                  CMP     #340,(R2)       ;SEQUENCE ERROR?
034404  001011                          BNE     TS341-10        ;BR TO ERROR HALT ON SEQ ERROR
034406  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
034412  012767  034422  143364          MOV     #RETB5,RTRAP5   ;RETURN POINTER
034420  000100                          JMP     %0              ;RESERVED INSTRUCTION
034422  020627  000774          RETB5:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
034426  001404                          BEQ     TS341
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 766           <
034430  012742  001032                  MOV     #1032,-(R2)     ;MOVE TO MAILBOX #  *******  1032  *******
034434  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034436  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************
                                ;TEST 341       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************
034440  005212                  TS341:  INC     (R2)            ;UPDATE TEST NUMBER
034442  022712  000341                  CMP     #341,(R2)       ;SEQUENCE ERROR?
034446  001012                          BNE     TS342-10        ;BR TO ERROR HALT ON SEQ ERROR
034450  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
034454  012767  034464  143322          MOV     #RETC5,RTRAP5   ;RETURN FROM TRAP POINTER
034462  000100                          JMP     %0              ;TRAP ON THIS INSTRUCTION
034464  022767  034464  144302  RETC5:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
```

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034472  001404                          BEQ     TS342
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 765           <====
034474  012742  001033                  MOV     #1033,-(R2)     ;MOVE TO MAILBOX #  *******  1033  *******
034500  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034502  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 342       TEST THAT 'OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
034504  005212                  TS342:  INC     (R2)            ;UPDATE TEST NUMBER
034506  022712  000342                  CMP     #342,(R2)       ;SEQUENCE ERROR?
034512  001037                          BNE     TS343-10        ;BR TO ERROR HALT ON SEQ ERROR
034514  012706  001000                  MOV     #BUFF,SP        ;SET UP
034520  012767  034536  143256          MOV     #RETD5,RTRAP5   ;SET UP
034526  005067  143244                  CLR     CC              ;CLEAR CC AND PRIORITY
034532  000257                          CCC
034534  000100                          JMP     %0              ;TRAP
034536  026727  144234  000000  RETD5:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
034544  001404                          BEQ     1$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <-
                                                        ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                        ;           WHICH FOLLOWS W/ 762           <=-
034546  012742  001034                  MOV     #1034,-(R2)     ;MOVE TO MAILBOX #  *******  1034  *******
034552  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034554  000000                          HALT                    ;INCORRECT STATUS
034556  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
034562  012767  034602  143214          MOV     #RETE5,RTRAP5   ;SET UP
034570  012767  000357  143200          MOV     #357,CC         ;SET PRIORITY
034576  000277                          SCC                     ;SET CC
034600  000100                          JMP     %0              ;TRAP
034602  026727  144170  000357  RETE5:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
034610  001404                          BEQ     TS343
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <-= -
                                                        ;           WHICH FOLLOWS W/ 740           <-
034612  012742  001035                  MOV     #1035,-(R2)     ;MOVE TO MAILBOX #  *******  1035  *******
034616  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034620  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 343       TEST THAT 'NEW'' STATUS IS CORRECT
                                ;*******************************************************************************
034622  005212                  TS343:  INC     (R2)            ;UPDATE TEST NUMBER
034624  022712  000343                  CMP     #343,(R2)       ;SEQUENCE ERROR?
034630  001106                          BNE     TS344-10        ;BR TO ERROR HALT ON SEQ ERROR
034632  012706  001000                  MOV     #BUFF,SP
034636  012767  034652  143140          MOV     #RETF5,RTRAP5
034644  005067  143136                  CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
034650  000100                          JMP     %0
034652                          RETF5:                          ;TEST FOR ''C'' CLEARED
034652  100004                          BPL     1$
```

```
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
034654  012742  001036                  MOV     #1036,-(R2)     ;MOVE TO MAILBOX #  *******  1036  *******
034660  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034662  000000                          HALT                    ;C NOT CLEARED
034664                          1$:
034664  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 761            <====
034666  012742  001037                  MOV     #1037,-(R2)     ;MOVE TO MAILBOX #  *******  1037  *******
034672  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034674  000000                          HALT                    ;Z NOT CLEARED
034676                          2$:
034676  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 754            <====
034700  012742  001040                  MOV     #1040,-(R2)     ;MOVE TO MAILBOX #  *******  1040  *******
034704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034706  000000                          HALT                    ;V NOT CLEARED
034710                          3$:
034710  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 747            <====
034712  012742  001041                  MOV     #1041,-(R2)     ;MOVE TO MAILBOX #  *******  1041  *******
034716  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034720  000000                          HALT                    ;C NOT CLEARED
034722  032767  000357  143046  4$:     BIT     #357,CC         ;TEST PRIORITY
034730  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 737            <====
034732  012742  001042                  MOV     #1042,-(R2)     ;MOVE TO MAILBOX #  *******  1042  *******
034736  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034740  000000                          HALT                    ;PRIORITY NOT ZERO
034742  012706  001000          5$:     MOV     #BUFF,SP
034746  012767  034764  143030          MOV     #RETG5,RTRAP5
034754  012767  000357  143024          MOV     #357,RTRAP5+2   ;SET NEW "CC" AND PRIORITY
034762  000100                          JMP     %0              ;TRAP HERE
034764                          RETG5:
034764  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 721            <====
034766  012742  001043                  MOV     #1043,-(R2)     ;MOVE TO MAILBOX #  *******  1043  *******
034772  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034774  000000                          HALT                    ;N NOT SET
```

```
034776                          1$:
034776  001404                          BEQ     2$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 714           <====
035000  012742  001044                  MOV     #1044,-(R2)     ;MOVE TO MAILBOX #  *******  1044  *******
035004  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035006  000000                          HALT                    ;Z NOT SET
035010                          2$:
035010  102404                          BVS     3$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 707           <====
035012  012742  001045                  MOV     #1045,-(R2)     ;MOVE TO MAILBOX #  *******  1045  *******
035016  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035020  000000                          HALT                    ;V NOT SET
035022                          3$:
035022  103404                          BCS     4$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 702           <====
035024  012742  001046                  MOV     #1046,-(R2)     ;MOVE TO MAILBOX #  *******  1046  *******
035030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035032  000000                          HALT                    ;C NOT SET
035034  016706  142736          4$:     MOV     CC,SP
035040  022706  000357                  CMP     #357,SP
035044  001404                          BEQ     TS344
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 671           <====
035046  012742  001047                  MOV     #1047,-(R2)     ;MOVE TO MAILBOX #  *******  1047  *******
035052  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035054  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 344       TEST THAT A TRAP OCCURES ON ALL ILLEGAL INSTRUCION
                                ;*******************************************************************************
035056  005212                  TS344:  INC     (R2)            ;UPDATE TEST NUMBER
035060  022712  000344                  CMP     #344,(R2)       ;SEQUENCE ERROR?
035064  001006                          BNE     TS345-10        ;BR TO ERROR HALT ON SEQ ERROR
035066  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
035072  012767  035112  142704          MOV     #RETH5,RTRAP5   ;RETURN LOCATION
035100  004000                          JSR     %0,%0           ;RESERVED INSTRUCTION, SHOULD TRAP
035102  012742  001050                  MOV     #1050,-(R2)     ;MOVE TO MAILBOX #  *******  1050  *******
035106  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035110  000000                          HALT                    ;DIDN'T TRAP,OR WRONG $TSTNM
035112                          RETH5:
                                ;*******************************************************************************
                                ;TEST 345       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************************
035112  005212                  TS345:  INC     (R2)            ;UPDATE TEST NUMBER
035114  022712  000345                  CMP     #345,(R2)       ;SEQUENCE ERROR?
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```
035120  001011                          BNE     TS346-10        ;BR TO ERROR HALT ON SEQ ERROR
035122  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
035126  012767  035136  142650          MOV     #RETJ,RTRAP5    ;RETURN POINTER
035134  004000                          JSR     %0,%0           ;RESERVED INSTRUCTION
035136  020627  000774          RETJ:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
035142  001404                          BEQ     TS346
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 766           <====
035144  012742  001051                  MOV     #1051,-(R2)     ;MOVE TO MAILBOX #  *******  1051  *******
035150  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035152  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 346       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************************
035154  005212                  TS346:  INC     (R2)            ;UPDATE TEST NUMBER
035156  022712  000346                  CMP     #346,(R2)       ;SEQUENCE ERROR?
035162  001012                          BNE     TS347-10        ;BR TO ERROR HALT ON SEQ ERROR
035164  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
035170  012767  035200  142606          MOV     #RETK,RTRAP5    ;RETURN FROM TRAP POINTER
035176  004000                  INSTK:  JSR     %0,%0           ;TRAP ON THIS INSTRUCTION
035200  022767  035200  143566  RETK:   CMP     #INSTK+2,BUFF-4 ;CHECK FOR INCREMENED P.C.
035206  001404                          BEQ     TS347
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <==-
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-=-
                                                                ;           WHICH FOLLOWS W/ 765           <  -
035210  012742  001052                  MOV     #1052,-(R2)     ;MOVE TO MAILBOX #  *******  1052  *******
035214  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035216  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 347       TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
035220  005212                  TS347:  INC     (R2)            ;UPDATE TEST NUMBER
035222  022712  000347                  CMP     #347,(R2)       ;SEQUENCE ERROR?
035226  001037                          BNE     TS350-10        ;BR TO ERROR HALT ON SEQ ERROR
035230  012706  001000                  MOV     #BUFF,SP        ;SET UP
035234  012767  035252  142542          MOV     #RETL,RTRAP5    ;SET UP
035242  005067  142530                  CLR     CC              ;CLEAR CC AND PRIORITY
035246  000257                          CCC
035250  004000                          JSR     %0,%0           ;TRAP
035252  026727  143520  000000  RETL:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
035260  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                ;           CONDITIONAL BRANCH INST. AND   <--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <=
                                                                ;           WHICH FOLLOWS W/ 762           <-=-
035262  012742  001053                  MOV     #1053,-(R2)     ;MOVE TO MAILBOX #  *******  1053  *******
035266  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035270  000000                          HALT                    ;INCORRCT STATUS
035272  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
035276  012767  035316  142500          MOV     #RETM,RTRAP5    ;SET UP
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035304  012767  000357  142464          MOV     #357,CC         ;SET PRIORITY
035312  000277                          SCC                     ;SET CC
035314  004000                          JSR     %0,%0           ;TRAP
035316  026727  143454  000357  RETM:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
035324  001404                          BEQ     TS350
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 740           <====
035326  012742  001054                  MOV     #1054,-(R2)     ;MOVE TO MAILBOX #  *******  1054  *******
035332  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035334  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 350       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
035336  005212                  TS350:  INC     (R2)            ;UPDATE TEST NUMBER
035340  022712  000350                  CMP     #350,(R2)       ;SEQUENCE ERROR?
035344  001105                          BNE     TS351-10        ;BR TO ERROR HALT ON SEQ ERROR
035346  012706  001000                  MOV     #BUFF,SP
035352  012767  035366  142424          MOV     #RETN,RTRAP5
035360  005067  142422                  CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
035364  004000                          JSR     %0,%0
035366                          RETN:                           ;TEST FOR "C" CLEARED
035366  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 766           <====
035370  012742  001055                  MOV     #1055,-(R2)     ;MOVE TO MAILBOX #  *******  1055  *******
035374  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035376  000000                          HALT                    ;C NOT CLEARED
035400                          1$:
035400  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
035402  012742  001056                  MOV     #1056,-(R2)     ;MOVE TO MAILBOX #  *******  1056  *******
035406  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035410  000000                          HALT                    ;Z NOT CLEARED
035412                          2$:
035412  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 754           <====
035414  012742  001057                  MOV     #1057,-(R2)     ;MOVE TO MAILBOX #  *******  1057  *******
035420  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035422  000000                          HALT                    ;V NOT CLEARED
035424                          3$:
035424  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 747           <====
```

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035426  012742  001060                  MOV     #1060,-(R2)     ;MOVE TO MAILBOX #  *******  1060  *******
035432  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035434  000000                          HALT                    ;C NOT CLEARED
035436  016700  142334          4$:     MOV     CC,%0           ;TEMP STORAGE
035442  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 740           <====
035444  012742  001061                  MOV     #1061,-(R2)     ;MOVE TO MAILBOX #  *******  1061  *******
035450  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035452  000000                          HALT                    ;PRIORITY NOT ZERO
035454  012706  001000          5$:     MOV     #BUFF,SP
035460  012767  035476  142316          MOV     #RETO,RTRAP5
035466  012767  000357  142312          MOV     #357,RTRAP5+2   ;SET NEW ''CC'' AND PRIORITY
035474  004000                          JSR     %0,%0           ;TRAP HERE
035476                          RETO:
035476  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 722           <====
035500  012742  001062                  MOV     #1062,-(R2)     ;MOVE TO MAILBOX #  *******  1062  *******
035504  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035506  000000                          HALT                    ;N NOT SET
035510                          1$:
035510  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 715           <====
035512  012742  001063                  MOV     #1063,-(R2)     ;MOVE TO MAILBOX #  *******  1063  *******
035516  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035520  000000                          HALT                    ;Z NOT SET
035522                          2$:
035522  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 710           <====
035524  012742  001064                  MOV     #1064,-(R2)     ;MOVE TO MAILBOX #  *******  1064  *******
035530  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035532  000000                          HALT                    ;V NOT SET
035534                          3$:
035534  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 703           <====
035536  012742  001065                  MOV     #1065,-(R2)     ;MOVE TO MAILBOX #  *******  1065  *******
035542  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035544  000000                          HALT                    ;C NOT SET
035546  016700  142224          4$:     MOV     CC,%0
035552  022700  000357                  CMP     #357,%0
035556  001404                          BEQ     TS351
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS
```

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                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 672           <====
035560  012742  001066                  MOV     #1066,-(R2)     ;MOVE TO MAILBOX #  *******  1066  *******
035564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035566  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 351       TEST THAT DECREMENT R6 TO A VALUE LESS THAN 400 TRAPS
                                ;*******************************************************************************
035570  005212                  TS351:  INC     (R2)            ;UPDATE TEST NUMBER
035572  022712  000351                  CMP     #351,(R2)       ;SEQUENCE ERROR?
035576  001006                          BNE     TS352-10        ;BR TO ERROR HALT ON SEQ ERROR
035600  012706  000150                  MOV     #150,%6         ;R6 = 150
035604  012767  035624  142172          MOV     #TDEC1,4        ;STACK OVERFLOW TRAP POINTER
035612  005746                          TST     -(6)            ;WITH R6 = 150 SHOULD TRAP
035614  012742  001067                  MOV     #1067,-(R2)     ;MOVE TO MAILBOX #  *******  1067  *******
035620  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035622  000000                          HALT                    ;SHOULD HAVE TRAPPED,OR WRONG $TSTNM
035624                          TDEC1:

                                ;*******************************************************************************
                                ;TEST 352       TEST FOR DECREMENT OF R6 ON OVERFLOW TRAP
                                ;*******************************************************************************
035624  005212                  TS352:  INC     (R2)            ;UPDATE TEST NUMBER
035626  022712  000352                  CMP     #352,(R2)       ;SEQUENCE ERROR?
035632  001011                          BNE     TS353-10        ;BR TO ERROR HALT ON SEQ ERROR
035634  012706  000150                  MOV     #150,%6         ;R6 = 150
035640  012767  035650  142136          MOV     #TDEC2,4        ;TRAP POINTER
035646  005746                          TST     -(6)            ;WITH R6 = 150 SHOULD TRAP
035650  020627  000142          TDEC2:  CMP     %6,#142         ;DID R6 DECREMENT
035654  001404                          BEQ     TS353
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                ;           WHICH FOLLOWS W/ 766           < -
035656  012742  001070                  MOV     #1070,-(R2)     ;MOVE TO MAILBOX #  *******  1070  *******
035662  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035664  000000                          HALT                    ;R6 NOT = 142,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 353       TEST DIFFERENT TYPES OF OVERFLOW
                                ;*******************************************************************************
035666  005212                  TS353:  INC     (R2)            ;UPDATE TEST NUMBER
035670  022712  000353                  CMP     #353,(R2)       ;SEQUENCE ERROR?
035674  001041                          BNE     TS354-10        ;BR TO ERROR HALT ON SEQ ERROR
035676  012706  000150                  MOV     #150,%6
035702  005067  142240                  CLR     146             ;STATUS WORD OF LOC 10
035706  012767  035716  142070          MOV     #TDEC3,4        ;RETURN TO LOC 4
035714  005246                          INC     -(6)
035716  005767  142224          TDEC3:  TST     146
035722  001004                          BNE     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=
```

```
                                                                ;            REPLACE THE MOVE INSTRUCTION   <====
                                                                ;            WHICH FOLLOWS W/ 764           <= ==
035724  012742  001071                  MOV     #1071,-(R2)     ;MOVE TO MAILBOX #  *******  1071  *******
035730  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035732  000000                          HALT                    ;INCREMENT OPERATION NOT INHIBITED
035734  012705  001000          1$:     MOV     #1000,%5
035740  012706  000400                  MOV     #400,%6
035744  012767  035764  142032          MOV     #TDEC4,4
035752  124645                          CMPB    -(6),-(5)
035754  012742  001072                  MOV     #1072,-(R2)     ;MOVE TO MAILBOX #  *******  1072  *******
035760  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035762  000000                          HALT                    ;STACK = 400 AND DECREMENTED, SHOULD TRAP
035764  012706  000400          TDEC4:  MOV     #400,%6
035770  012767  036010  142006          MOV     #TDEC7,4
035776  134546                          BITB    -(5),-(6)
036000                          TDEC6:
036000  012742  001073                  MOV     #1073,-(R2)     ;MOVE TO MAILBOX #  *******  1073  *******
036004  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036006  000000                          HALT                    ;NO STACK OVERFLOW,OR WRONG $TSTNM
036010                          TDEC7:

                                ;*******************************************************************************
                                ;TEST 354       TEST THAT AN 77 CAUSES AN OVERFLOW TRAP
                                ;******************************************************************************** **
036010  005212                  TS354:  INC     (R2)            ;UPDATE TEST NUMBER
036012  022712  000354                  CMP     #354,(R2)       ;SEQUENCE ERROR?
036016  001011                          BNE     VDEC2           ;BR TO ERROR HALT ON SEQ ERROR
036020  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036024  012767  036042  141756          MOV     #VDEC2,10       ;SET UP 77 VECTOR
036032  012767  036052  141744          MOV     #VDEC1,4        ;SET UP OVERFLOW VECTOR
036040  000077                          77                      ;THIS TRAP SHOULD CAUSE OVERFLOW
036042                          VDEC2:
036042  012742  001074                  MOV     #1074,-(R2)     ;MOVE TO MAILBOX #  *******  1074  *******
036046  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036050  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036052  012767  000012  141730  VDEC1:  MOV     #10+2,10
                                ;*******************************************************************************
                                ;TEST 355       TEST THAT AN IOT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036060  005212                  TS355:  INC     (R2)            ;UPDATE TEST NUMBER
036062  022712  000355                  CMP     #355,(R2)       ;SEQUENCE ERROR?
036066  001011                          BNE     VDEC4           ;BR TO ERROR HALT ON SEQ ERROR
036070  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036074  012767  036112  141716          MOV     #VDEC4,20       ;SET UP IOT VECTOR
036102  012767  036122  141674          MOV     #VDEC3,4        ;SET UP OVERFLOW VECTOR
036110  000004                          IOT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
036112                          VDEC4:
036112  012742  001075                  MOV     #1075,-(R2)     ;MOVE TO MAILBOX #  *******  1075  *******
036116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036120  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036122  012767  000022  141670  VDEC3:  MOV     #20+2,20
                                ;*******************************************************************************
                                ;TEST 356       TEST THAT AN EMT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036130  005212                  TS356:  INC     (R2)            ;UPDATE TEST NUMBER
036132  022712  000356                  CMP     #356,(R2)       ;SEQUENCE ERROR?
```

```
036136  001011                          BNE     VDEC6           ;BR TO ERROR HALT ON SEQ ERROR
036140  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036144  012767  036162  141656          MOV     #VDEC6,30       ;SET UP EMT VECTOR
036152  012767  036172  141624          MOV     #VDEC5,4        ;SET UP OVERFLOW VECTOR
036160  104000                          EMT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
036162                          VDEC6:
036162  012742  001076                  MOV     #1076,-(R2)     ;MOVE TO MAILBOX #  *******  1076  *******
036166  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036170  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036172  012767  000032  141630  VDEC5:  MOV     #30+2,30
                                ;*******************************************************************************
                                ;TEST 357       TEST THAT AN TRAP CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036200  005212                  TS357:  INC     (R2)            ;UPDATE TEST NUMBER
036202  022712  000357                  CMP     #357,(R2)       ;SEQUENCE ERROR?
036206  001011                          BNE     VDEC8           ;BR TO ERROR HALT ON SEQ ERROR
036210  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036214  012767  036232  141612          MOV     #VDEC8,34       ;SET UP TRAP VECTOR
036222  012767  036242  141554          MOV     #VDEC7,4        ;SET UP OVERFLOW VECTOR
036230  104400                          TRAP                    ;THIS TRAP SHOULD CAUSE OVERFLOW
036232                          VDEC8:
036232  012742  001077                  MOV     #1077,-(R2)     ;MOVE TO MAILBOX #  *******  1077  *******
036236  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036240  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036242  012767  000036  141564  VDEC7:  MOV     #34+2,34
                                ;*******************************************************************************
                                ;TEST 360       TEST THAT AN TRT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036250  005212                  TS360:  INC     (R2)            ;UPDATE TEST NUMBER
036252  022712  000360                  CMP     #360,(R2)       ;SEQUENCE ERROR?
036256  001011                          BNE     VDEC10          ;BR TO ERROR HALT ON SEQ ERROR
036260  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036264  012767  036302  141522          MOV     #VDEC10,14      ;SET UP TRT VECTOR
036272  012767  036312  141504          MOV     #VDEC9,4        ;SET UP OVERFLOW VECTOR
036300  000003                          TRT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
036302                          VDEC10:
036302  012742  001100                  MOV     #1100,-(R2)     ;MOVE TO MAILBOX #  *******  1100  *******
036306  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036310  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036312  012767  000016  141474  VDEC9:  MOV     #14+2,14
                                ;*******************************************************************************
                                ;TEST 361       TEST THAT AN ILLA CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036320  005212                  TS361:  INC     (R2)            ;UPDATE TEST NUMBER
036322  022712  000361                  CMP     #361,(R2)       ;SEQUENCE ERROR?
036326  001011                          BNE     VDEC11          ;BR TO ERROR HALT ON SEQ ERROR
036330  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036334  012767  036352  141446          MOV     #VDEC11,10      ;SET UP ILLA VECTOR
036342  012767  036362  141434          MOV     #VDEC12,4       ;SET UP OVERFLOW VECTOR
036350  004700                          ILLA                    ;THIS TRAP SHOULD CAUSE OVERFLOW
036352                          VDEC11:
036352  012742  001101                  MOV     #1101,-(R2)     ;MOVE TO MAILBOX #  *******  1101  *******
036356  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036360  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036362  012767  000012  141420  VDEC12: MOV     #10+2,10
036370  020627  000370                  CMP     %6,#370         ;STACK PUSHED FOUR WORDS?
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036374  001404                          BEQ     TS362
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-----
                                                        ;           CONDITIONAL BRANCH INST. AND    <==
                                                        ;           REPLACE THE MOVE INSTRUCTION    <===-
                                                        ;           WHICH FOLLOWS W/ 754            <-===-
036376  012742  001102                  MOV     #1102,-(R2)     ;MOVE TO MAILBOX #  *******  1102  *******
036402  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036404  000000                          HALT                    ;TRAP OVERFLOW DID NOT OCCUR
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 362       TEST THAT AN ILLB CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036406  005212                  TS362:  INC     (R2)            ;UPDATE TEST NUMBER
036410  022712  000362                  CMP     #362,(R2)       ;SEQUENCE ERROR?
036414  001011                          BNE     VDEC13          ;BR TO ERROR HALT ON SEQ ERROR
036416  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036422  012767  036440  141360          MOV     #VDEC13,10      ;SET UP ILLB VECTOR
036430  012767  036450  141346          MOV     #VDEC14,4       ;SET UP OVERFLOW VECTOR
036436  000100                          ILLB                    ;THIS TRAP SHOULD CAUSE OVERFLOW
036440                          VDEC13:
036440  012742  001103                  MOV     #1103,-(R2)     ;MOVE TO MAILBOX #  *******  1103  *******
036444  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036446  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036450  012767  000012  141332  VDEC14: MOV     #10+2,10
                                ;*******************************************************************************
                                ;TEST 363       TEST FOR FALSE OVERFLOW TRAP
                                ;*******************************************************************************
036456  005212                  TS363:  INC     (R2)            ;UPDATE TEST NUMBER
036460  022712  000363                  CMP     #363,(R2)       ;SEQUENCE ERROR?
036464  001023                          BNE     FOVER           ;BR TO ERROR HALT ON SEQ ERROR

036466  012767  036534  141310          MOV     #FOVER,4        ;SET UP OVERFLOW POINTER
036474  012706  001002                  MOV     #1002,%6
036500  005746                          TST     -(6)            ;SHOULD NOT OVERFLOW
036502  012706  002002                  MOV     #2002,%6
036506  005746                          TST     -(6)            ;SHOULD NOT OVERFLOW
036510  012706  004002                  MOV     #4002,%6
036514  005746                          TST     -(6)            ;SHOULD NOT OVERFLOW
036516  012706  010002                  MOV     #10002,%6
036522  005746                          TST     -(6)
036524  012706  020000                  MOV     #20000,%6       ;SHOULD NOT OVERFLOW
036530  005746                          TST     -(6)
036532  000404                          BR      STP
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                        ;           CONDITIONAL BRANCH INST. AND    <--
                                                        ;           REPLACE THE MOVE INSTRUCTION    <==-
                                                        ;           WHICH FOLLOWS W/ 754            <==--

036534                          FOVER:
036534  012742  001104                  MOV     #1104,-(R2)     ;MOVE TO MAILBOX #  *******  1104  *******
036540  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036542  000000                          HALT                    ;IT OVERFLOWED,OR WRONG $TSTNM
```

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036544  012767  000006  141232  STP:    MOV     #6,4
036552  005067  141230          CLR     6
                        ;*******************************************************************************
                        ;TEST 364       TEST THAT BIT 4 PSW WILL CAUSE A TRAP TO 14
                        ;*******************************************************************************
036556  005212          TS364:  INC     (R2)            ;UPDATE TEST NUMBER
036560  022712  000364          CMP     #364,(R2)       ;SEQUENCE ERROR?
036564  001013                  BNE     TS365-10        ;BR TO ERROR HALT ON SEQ ERROR
036566  012706  001000          MOV     #BUFF,SP
036572  012767  036624  141214  MOV     #RETAT,RTRAP4   ;SET UP TO TRAP TO 14
036600  012746  000020          MOV     #20,-(SP)       ;PUSH T BIT
036604  012746  036612          MOV     #.+6,-(SP)      ;PUSH PC
036610  000002                  RTI                     ;SET T BIT
036612  000240                  NOP                     ;TRAP HERE
036614  012742  001105          MOV     #1105,-(R2)     ;MOVE TO MAILBOX #  *******  1105  *******
036620  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036622  000000                  HALT                    ;TRACE BIT DID NOT TRAP!,OR WRONG $TESTN
036624                  RETAT:
                        ;*******************************************************************************
                        ;TEST 365       TEST  STACK POINTER DECREMENTS
                        ;*******************************************************************************
036624  005212          TS365:  INC     (R2)            ;UPDATE TEST NUMBER
036626  022712  000365          CMP     #365,(R2)       ;SEQUENCE ERROR?
036632  001022                  BNE     TS366-10        ;BR TO ERROR HALT ON SEQ ERROR
036634  012706  001000          MOV     #BUFF,SP
036640  012767  036672  141146  MOV     #RETBT,RTRAP4
036646  012746  000020          MOV     #20,-(SP)       ;PUSH T BIT
036652  012746  036660          MOV     #.+6,-(SP)      ;PUSH PC
036656  000002                  RTI                     ;SET T BIT
036660  000240                  NOP                     ;TRAP HERE
036662  012742  001106          MOV     #1106,-(R2)     ;MOVE TO MAILBOX #  *******  1106  *******
036666  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036670  000000                  HALT                    ;TRACE BIT DID NOT TRAP!
036672  020627  000774  RETBT:  CMP     SP,#BUFF-4
036676  001404                  BEQ     TS366
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                        ;           CONDITIONAL BRANCH INST. AND    <-
                                                        ;           REPLACE THE MOVE INSTRUCTION    <-
                                                        ;           WHICH FOLLOWS W/ 755            <-
036700  012742  001107          MOV     #1107,-(R2)     ;MOVE TO MAILBOX #  *******  1107  *******
036704  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036706  000000                  HALT                    ;STACK POINTER WAS NOT PUSHED BY TRAP,OR WRONG $TESTN
                                                        ;  OR SEQUENCE ERROR
                        ;*******************************************************************************
                        ;TEST 366       TEST  FOR PROPER PC ON STACK
                        ;*******************************************************************************
036710  005212          TS366:  INC     (R2)            ;UPDATE TEST NUMBER
036712  022712  000366          CMP     #366,(R2)       ;SEQUENCE ERROR?
036716  001016                  BNE     TS367-10        ;BR TO ERROR HALT ON SEQ ERROR
036720  012706  001000          MOV     #BUFF,SP
036724  012767  036744  141062  MOV     #RETCT,RTRAP4
036732  012746  000020          MOV     #20,-(SP)       ;PUSH T BIT
036736  012746  036744          MOV     #.+6,-(SP)      ;PUSH PC
036742  000002                  RTI                     ;SET T BIT
                                                        ;TRAP HERE
036744  022767  036744  142022  RETCT:  CMP     #.,BUFF-4
```

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036752  001404                          BEQ     TS367
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 761           <====
036754  012742  001110                  MOV     #1110,-(R2)     ;MOVE TO MAILBOX #  *******  1110  *******
036760  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036762  000000                          HALT                    ;CORRECT PC WAS NOT SAVED ON STACK,OR WRONG $TESTN
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 367       TEST  THAT RTT POPS T- BIT
                                ;*******************************************************************************
036764  005212                  TS367:  INC     (R2)            ;UPDATE TEST NUMBER
036766  022712  000367                  CMP     #367,(R2)       ;SEQUENCE ERROR?
036772  001015                          BNE     TS370-10        ;BR TO ERROR HALT ON SEQ ERROR

036774  012706  001000                  MOV     #BUFF,SP
037000  005001                          CLR     R1              ;CLEAR R1
037002  012746  000020                  MOV     #20,-(SP)
037006  012746  037022                  MOV     #RTT1,-(SP)
037012  012767  037036  140774          MOV     #RTT2,14
037020  000006                          RTT
037022  000240                  RTT1:   NOP
037024  001404                          BEQ     TS370
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 762           <
037026  012742  001111                  MOV     #1111,-(R2)     ;MOVE TO MAILBOX #  *******  1111  *******
037032  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037034  000000                          HALT                    ;T-BIT DID NOT TRAP,OR WRONG $TESTN
                                                                ;  OR SEQUENCE ERROR


037036                          RTT2:
                                ;*******************************************************************************
                                ;TEST 370       TEST  THAT RTT ALLOWS ONE INST. BEFORE TRAP
                                ;*******************************************************************************
037036  005212                  TS370:  INC     (R2)            ;UPDATE TEST NUMBER
037040  022712  000370                  CMP     #370,(R2)       ;SEQUENCE ERROR?
037044  001030                          BNE     TS371-10        ;BR TO ERROR HALT ON SEQ ERROR
037046  012705  177777                  MOV     #177777,%5
037052  012706  001000          RTT5:   MOV     #BUFF,SP
037056  012746  000020                  MOV     #20,-(SP)
037062  012746  037100                  MOV     #RTT3,-(SP)
037066  012767  037116  140720          MOV     #RTT4,14
037074  005001                          CLR     R1              ;CLEAR R0
037076  000006                          RTT                     ;SET T-BIT
037100  005201                  RTT3:   INC     R1
037102  005205                          INC     %5
037104  001762                          BEQ     RTT5            ;DO THIS TEST NO MORE THAN 2 TIMES
037106  012742  001112                  MOV     #1112,-(R2)     ;MOVE TO MAILBOX #  *******  1112  *******
037112  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037114  000000                          HALT                    ;DID NOT TRAP
037116  005301                  RTT4:   DEC     R1              ;SEE IF RTT ALLOWS 1 INST.
```

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037120  001406                          BEQ     RTT6
037122  005205                          INC     %5                      ;DO THIS TEST NO MORE THAN TWO TIMES
037124  001752                          BEQ     RTT5
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 747            <====
037126  012742  001113                  MOV     #1113,-(R2)             ;MOVE TO MAILBOX #  *******  1113  *******
037132  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
037134  000000                          HALT                            ;RTT DID NOT ALLOW 1 INST.,OR WRONG $TESTN
037136                          RTT6:
                                ;*******************************************************************************
                                ;TEST 371       TEST  THAT RTI DOES NOT ALLOW 1 INST.
                                ;*******************************************************************************
037136  005212                  TS371:  INC     (R2)                    ;UPDATE TEST NUMBER
037140  022712  000371                  CMP     #371,(R2)               ;SEQUENCE ERROR?
037144  001022                          BNE     TS372-10                ;BR TO ERROR HALT ON SEQ ERROR
037146  012706  001000                  MOV     #BUFF,SP
037152  012746  000020                  MOV     #20,-(SP)
037156  012746  037174                  MOV     #RTI1,-(SP)
037162  012767  037206  140624          MOV     #RTI2,14
037170  005001                          CLR     R1
037172  000002                          RTI                             ;SET T-BIT
037174  005201                  RTI1:   INC     R1                      ;RTI SHOULD NOT ALLOW THIS
037176  012742  001114                  MOV     #1114,-(R2)             ;MOVE TO MAILBOX #  *******  1114  *******
037202  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
037204  000000                          HALT                            ;T- BIT DID NOT CAUSE TRAP
037206  005701                  RTI2:   TST     R1
                                                                        ;RTI SHOULD NOT ALLOW 1 INST. BEFORE TRAP
037210  001404                          BEQ     TS372
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 755            <====
037212  012742  001115                  MOV     #1115,-(R2)             ;MOVE TO MAILBOX #  *******  1115  *******
037216  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
037220  000000                          HALT                            ;RTI DID ALLOW 1 INST. BEFORE TRAP,OR WRONG $TESTN
                                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 372       TEST TRAP ON TRAP THAT TRACE BIT TRAPS ARE INHIBITED ON TRAP INST
                                ;*******************************************************************************
037222  005212                  TS372:  INC     (R2)                    ;UPDATE TEST NUMBER
037224  022712  000372                  CMP     #372,(R2)               ;SEQUENCE ERROR?
037230  001026                          BNE     BR70                    ;BR TO ERROR HALT ON SEQ ERROR

037232  012706  001000                  MOV     #BUFF,%6
037236  012767  037276  140550          MOV     #TRACE,14               ;TRACE TRAP
037244  005027  000016                  CLR     #16
037250  005027  000022                  CLR     #22
037254  012767  037316  140536          MOV     #TONT1,20               ;IOT TRAP
037262  012746  000020                  MOV     #20,-(SP)               ;PUSH T BIT
037266  012746  037274                  MOV     #.+6,-(SP)              ;PUSH PC
037272  000006                          RTT
037274  000004                          IOT                             ;TRAP, NEW PC HAVE TRACE RESET
037276                          TRACE:
```

```
037276  012742  001116                  MOV     #1116,-(R2)      ;MOVE TO MAILBOX #  *******  1116  *******
037302  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037304  000000                          HALT                     ;TRACE TRAP WAS NOT INHIBITED
037306                          BR70:
037306  012742  001117                  MOV     #1117,-(R2)      ;MOVE TO MAILBOX #  *******  1117  *******
037312  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037314  000000                          HALT                     ;WRONG TSTNM,OR WRONG $TSTNM
037316  012767  000016  140470  TONT1:  MOV     #16,14
037324  012767  000022  140466          MOV     #22,20
                                ;*******************************************************************************
                                ;TEST 373       TEST THAT THE TRACE BIT IS SAVED IN THE STACK
                                ;*******************************************************************************
037332  005212                  TS373:  INC     (R2)             ;UPDATE TEST NUMBER
037334  022712  000373                  CMP     #373,(R2)        ;SEQUENCE ERROR?
037340  001020                          BNE     STP3             ;BR TO ERROR HALT ON SEQ ERROR
037342  012706  001000                  MOV     #BUFF,%6         ;SET UP STACK POINTER
037346  012767  037372  140440          MOV     #TRC1,14         ;TRACE TRAP RETURN
037354  005067  140436                  CLR     16
037360  012746  000020                  MOV     #20,-(SP)        ;SET THE T BIT
037364  012746  037372                  MOV     #TRC1,-(SP)
037370  000002                          RTI
037372  036727  141400  000020  TRC1:   BIT     BUFF-2,#20       ;CHECK FOR T BIT ON STACK
037400  001004                          BNE     STP3D
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                 ;           CONDITIONAL BRANCH INST. AND   <
                                                                 ;           REPLACE THE MOVE INSTRUCTION   <
                                                                 ;           WHICH FOLLOWS W/ 757           <
037402                          STP3:
037402  012742  001120                  MOV     #1120,-(R2)      ;MOVE TO MAILBOX #  *******  1120  *******
037406  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037410  000000                          HALT                     ;T BIT NOT SAVED ON THE STACK,OR WRONG $TSTNM
037412  012767  000016  140374  STP3D:  MOV     #16,14

                                ;*******************************************************************
                                ;THIS ROUTINE TESTS THAT NO LEGAL ADDRESS TRAPS AND THAT AN ILLEGAL
                                ;ADDRESS TRAPS TO LOCATION 4.  THIS WILL RUN ON 30K SYSTEM.  BUT IF
                                ;SWITCH REGISTER BIT 1=0, THEN THE MEMORY FROM 28K-30K IS NOT LOOKED
                                ;AT, SINCE IT MAY HAVE I/O DEVICES.  IF SWR BIT 1=1, THEN THAT AREA IS
                                ;CHECKED.  (IT SHOULD EITHER ALL TRAP OR ALL NOT TRAP).  LOC 160000
                                ;IS NO LONGER GUARANTEED TO TRAP, SINCE IT MAY CONTAIN MEMORY. LOCATION
                                ;177700 (THE UNIBUS ADDRESS FOR R0 ON OLDER SYSTEMS) IS USED FOR FORCING
                                ;A TIMEOUT IN THE EVENT THAT THERE WAS NO TIMEOUT FROM 0K-28K OR 30K.
                                ;THIS ROUTINE TESTS MEMORY UNTIL IT DOES A NXM STOP
                                ;*******************************************************************************
                                ;TEST 374       TEST NON-EXISTENT ADDRESS TRAPS
                                ;*******************************************************************************
037420  005212                  TS374:  INC     (R2)             ;UPDATE TEST NUMBER
037422  022712  000374                  CMP     #374,(R2)        ;SEQUENCE ERROR?
037426  001150                          BNE     TS375-10         ;BR TO ERROR HALT ON SEQ ERROR
037430  042737  010000  037500          BIC     #10000,@#HICORE  ;SET HIGHT CORE LIMIT TO 160000
037436  032777  000002  170010          BIT     #2,@SWR          ;CHECK IF BIT 1 IS CLEARED
037444  001403                          BEQ     1$               ;BRANCH IF IT IS, LEAVE LIMIT-160000
037446  052737  010000  037500          BIS     #10000,@#HICORE  ;SET UPPER CORE LIMIT TO 30K (170000)
037454  005000                  1$:     CLR     R0               ;
037456  005067  140324                  CLR     6                ;
037462  012767  037570  140314          MOV     #ATRAP,4         ;SET UP ADDRESS TRAP ENTRANCE
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```
037470  012706  001000                  MOV     #BUFF,SP        ;SET STACK POINTER
037474  105720                  NOR:    TSTB    (0)+            ;IF OUTSIDE OF CORE, TRAP TO 4
037476  020027                          CMP     R0,(PC)+        ;IS POINTER INSIDE 28K (30K) CORE
037500  160000                  HICORE: .WORD   160000          ;MAY BE CHANGED TO 170000 IF 30K
037502  103774                          BLO     NOR             ;TEST THE REST OF CORE
037504  012737  037526  000004          MOV     #ROTRAP,@#4     ;SET UP NEW VECTOR POINTER
037512  105737  177700                  TSTB    @#177700        ;SHOULD CAUSE A TRAP
037516                          TRPADR:
037516  012742  001121                  MOV     #1121,-(R2)     ;MOVE TO MAILBOX #  *******  1121  *******
037522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037524  000000                          HALT                    ;SHOULD HAVE TRAPED
                                ;TRAP TO HERE IF FORCING TRAP BY TESTING 177700
037526  106767  140244          ROTRAP: MFPS    STATUS
037532  005767  140240                  TST     STATUS          ;TEST PSW
037536  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=---
                                                                ;           CONDITIONAL BRANCH INST. AND   <=--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <---=
                                                                ;           WHICH FOLLOWS W/ 733           <
037540  012742  001122                  MOV     #1122,-(R2)     ;MOVE TO MAILBOX #  *******  1122  *******
037544  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037546  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
037550  026727  141220  037516  1$:     CMP     BUFF-4,#TRPADR  ;TEST OLD PC AT STACK
037556  001453                          BEQ     TRAPB
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                ;           CONDITIONAL BRANCH INST. AND   <
                                                                ;           REPLACE THE MOVE INSTRUCTION   <
                                                                ;           WHICH FOLLOWS W/ 723           <
037560  012742  001123                  MOV     #1123,-(R2)     ;MOVE TO MAILBOX #  *******  1123  *******
037564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037566  000000                          HALT                    ;OLD PC WAS NOT SAVED
                                ;RETURN HERE ON AN ADDRESS TRAP FROM MEMORY BELOW 28K (OR 30K)
037570  005300                  ATRAP:  DEC     R0              ;
037572  010067  000032                  MOV     R0,CORH         ;MOVE THE FIRST NXM LOCATION IN CORH
                                ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTENT MEMORY LOCATION
037576  013700  037500                  MOV     @#HICORE,R0     ;SET UP THE HIGHEST MEM LOCATION
037602  005300                          DEC     R0              ;MAKE 1 LESS THAN THE HIGHEST CORE BOUNDARY
037604  000402                          BR      NOSUB           ;DON'T SUBTRACT 1K FIRST TIME
037606  162700  001000          CTRAP:  SUB     #1000,R0        ;SUBTRACT 1K OCTAL BYTE FROM ADDRESS
                                                                ;TO SPEED UP TESTING
037612  012767  037644  140164  NOSUB:  MOV     #BTRAP,4        ;SET UP THE VECTOR
037620  012706  001000                  MOV     #BUFF,SP
037624  005710                          TST     (R0)            ;DOES THIS MEMORY EXIST?
                                                                ;IF NXM, TRAP TO BTRAP
037626  020027                  DTRAP1: CMP     R0,(PC)+        ;IF EXISTS, IS THIS THE SAME TRAP THAT CAUSED
                                                                ;TRAP TO ATRAP
037630  000000                  CORH:   .WORD   0
037632  101425                          BLOS    TRAPB
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=---=
                                                                ;           CONDITIONAL BRANCH INST. AND   <=--
                                                                ;           REPLACE THE MOVE INSTRUCTION   <==-
                                                                ;           WHICH FOLLOWS W/ 675           <=--
037634  012742  001124                  MOV     #1124,-(R2)     ;MOVE TO MAILBOX #  *******  1124  *******
037640  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037642  000000                          HALT                    ;CONTENTS OF R0 SHOULD BE LESS THAN OR EQUAL TO CORH
                                                                ;IF THIS COMPARISON FAILS IT MEANS
```

```
                                                                ;THAT SOME LEGAL ADDRESS TRAPPED, OR
                                                                ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
037644  106767  140126          BTRAP:  MFPS    STATUS
037650  005767  140122                  TST     STATUS
037654  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <
                                                                ;           WHICH FOLLOWS W/ 664            <
037656  012742  001125                  MOV     #1125,-(R2)     ;MOVE TO MAILBOX #  *******  1125  *******
037662  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037664  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
037666  026727  141102  037626  1$:     CMP     BUFF-4,#DTRAP1  ;CHECK IF TRAP PC IS OK
037674  001744                          BEQ     CTRAP
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <-
                                                                ;           CONDITIONAL BRANCH INST. AND    <-
                                                                ;           REPLACE THE MOVE INSTRUCTION    <=
                                                                ;           WHICH FOLLOWS W/ 654            <-=-
037676                          AUTO1:
037676  012742  001126                  MOV     #1126,-(R2)     ;MOVE TO MAILBOX #  *******  1126  *******
037702  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037704  000000                          HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
037706  012767  000006  140070  TRAPB:  MOV     #6,4            ;RESET TRAP CATCHER
037714  005067  140066                  CLR     6               ;RESET TRAP CATCHER


                                ;THIS ROUTINE WILL FIGURE OUT IF YOU HAVE A DL11W
037720  005067  000020                  CLR     PROFTE
037724  012706  001000                  MOV     #BUFF,SP        ;SET UP THE STACK POINTER
037730  012767  037746  140046          MOV     #DL11W,4        ;SET UP THE TRAP VECTOR
037736  005767  137622                  TST     TPS             ;TEST THE PUNCH STATUS REGISTER
037742  000403                          BR      DL11W1
037744  000000                  PROFTE: 000000
037746  005267  177772          DL11W:  INC     PROFTE          ;INCR IF NO DL11W
037752  012767  000006  140024  DL11W1: MOV     #6,4

037760                          SKP104:
                                ;*******************************************************************************
                                ;TEST 375       TEST THAT A TTY INTERRUPT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
037760  005212                  TS375:  INC     (R2)            ;UPDATE TEST NUMBER
037762  022712  000375                  CMP     #375,(R2)       ;SEQUENCE ERROR?
037766  001037                          BNE     TDEC8           ;BR TO ERROR HALT ON SEQ ERROR
037770  005767  177750                  TST     PROFTE
037774  001047                          BNE     R7TRX
037776  122767  000001  140314          CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
040004  001003                          BNE     2$                      ;IF NOT, DO THIS TEST
040006  005767  140274                  TST     $PASS                   ;IS THIS THE FIRST PASS?
040012  001040                          BNE     R7TRX                   ;IF NOT FIRST PASS, SKIP TEST
040014                          2$:
040014  000005                          RESET                           ;
040016  012767  000340  137752          MOV     #340,STATUS     ;LOCK OUT INTERRUPT
040024  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
040030  012767  040076  137746          MOV     #TDEC77,4       ;SET UP OVERFLOW TRAP
040036  012767  040066  140020          MOV     #TDEC8,64       ;SET UP INTERRUPT VECTOR
040044  012767  000100  137512          MOV     #100,TTCSR      ;SET INTERRUPT ENABLE
```

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040052  005067  137720                  CLR     STATUS          ;ALLOW INTERRUPT TO OCCUR
040056  012742  001127                  MOV     #1127,-(R2)     ;MOVE TO MAILBOX #  *******  1127  *******
040062  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040064  000000                          HALT                    ;NO INTERRUPT OCCURRED
040066                          TDEC8:
040066  012742  001130                  MOV     #1130,-(R2)     ;MOVE TO MAILBOX #  *******  1130  *******
040072  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040074  000000                          HALT                    ;OVERFLOW TRAP DID NOT OCCUR OR WRONG $TSTNM
040076  005067  137462          TDEC77: CLR     TTCSR           ;CLEAR INTERRUPT ENABLE
040102  012767  000006  137674          MOV     #6,4
040110  005067  137672                  CLR     6
040114                          R7TRX:
                                ;*******************************************************************************
                                ;TEST 376       TEST THAT A PENDING INTERRUPT OCCURS BEFORE TRAP
                                ;*******************************************************************************
040114  005212                  TS376:  INC     (R2)            ;UPDATE TEST NUMBER
040116  022712  000376                  CMP     #376,(R2)       ;SEQUENCE ERROR?
040122  001045                          BNE     BR71            ;BR TO ERROR HALT ON SEQ ERROR
040124  005767  177614                  TST     PROFTE
040130  001053                          BNE     NODL
040132  122767  000001  140160          CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
040140  001003                          BNE     2$                      ;IF NOT, DO THIS TEST
040142  005767  140140                  TST     $PASS                   ;IS THIS THE FIRST PASS?
040146  001044                          BNE     NODL                    ;IF NOT FIRST PASS, SKIP TEST
040150                          2$:
040150  012706  001000                  MOV     #BUFF,%6
040154  012767  000340  137614          MOV     #340,STATUS     ;SET TO A HIGH PRIORITY LEVEL
040162  012767  040226  137674          MOV     #TR0,64
040170  012767  000100  137366          MOV     #100,TTCSR      ;INTERRUPT FOR TTY PUNCH/PRINTER
040176  012767  040236  137630          MOV     #BR71,34        ;TRAP VECTOR
040204  012767  040246  137652          MOV     #TR2,64         ;TTY VECTOR
040212  012767  000340  137616          MOV     #340,36         ;IF TRAP TRAPS, MOVE 340 TO PRIORITY
040220  005067  137552                  CLR     STATUS          ;SHOULD INTERRUPT AT END OF CLR INST
040224  104400                          TRAP                    ;TTY INTERRUPT SHOULD OVERRIDE TRAP
040226                          TR0:
040226  012742  001131                  MOV     #1131,-(R2)     ;MOVE TO MAILBOX #  *******  1131  *******
040232  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040234  000000                          HALT                    ;TTY SHOULDN'T HAVE INTERRUPTED
040236                          BR71:
040236  012742  001132                  MOV     #1132,-(R2)     ;MOVE TO MAILBOX #  *******  1132  *******
040242  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040244  000000                          HALT                    ;TRAP OCCURRED FIRST,OR WRONG $TSTNM
040246  005067  137564          TR2:    CLR     36
040252  042767  000100  137304          BIC     #100,TTCSR
040260                          NODL:
                                ;*******************************************************************************
                                ;TEST 377       TEST THAT A PENDING INTERRUPT, INTERRUPTS BETWEEN TRAPS
                                ;*******************************************************************************
040260  005212                  TS377:  INC     (R2)            ;UPDATE TEST NUMBER
040262  022712  000377                  CMP     #377,(R2)       ;SEQUENCE ERROR?
040266  001043                          BNE     TR5             ;BR TO ERROR HALT ON SEQ ERROR
040270  005767  177450                  TST     PROFTE
040274  001063                          BNE     NODL1
040276  122767  000001  140014          CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
040304  001003                          BNE     2$                      ;IF NOT, DO THIS TEST
040306  005767  137774                  TST     $PASS                   ;IS THIS THE FIRST PASS?
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040312  001054                          BNE     NODL1                   ;IF NOT FIRST PASS, SKIP TEST
040314                          2$:
040314  012706  001000                  MOV     #BUFF,%6
040320  012767  000340  137450          MOV     #340,STATUS
040326  012767  000100  137230          MOV     #100,TTCSR
040334  012767  040374  137472          MOV     #TR3,34         ;TRAP
040342  012767  040406  137514          MOV     #TR4,64         ;TTY OUTPUT
040350  012767  000340  137510          MOV     #340,66         ;TTY OUTPUT PRIORITY
040356  012767  040376  137434          MOV     #TR5,20         ;IOT
040364  012767  000340  137430          MOV     #340,22         ;IOT PRIORITY
040372  104400                          TRAP                    ;THE ACT OF TRAPPING LOWER PRIORITY
040374  000004                  TR3:    IOT                     ;INTERRUPT SHOULD OCCUR IN PLACE OF IOT TRAP
040376                          TR5:
040376  012742  001133                  MOV     #1133,-(R2)     ;MOVE TO MAILBOX #  *******  1133  *******
040402  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040404  000000                          HALT                    ;NO INTERRUPT BETWEEN TRAPS,OR WRONG $TSTNM
040406  005067  137410          TR4:    CLR     22              ;CLR IOT PRIORITY
040412  005067  137450                  CLR     66
040416  012767  000036  137410          MOV     #36,34
040424  012767  000066  137432          MOV     #66,64
040432  012767  000022  137360          MOV     #22,20
040440  005067  137120                  CLR     TTCSR
040444                          NODL1:

                                ;*******************************************************************
                                ;TEST 400       TEST THAT "RESET" GOES TO OUTSIDE WORLD
                                ;*******************************************************************
040444  005212                  TS400:  INC     (R2)            ;UPDATE TEST NUMBER
040446  022712  000400                  CMP     #400,(R2)       ;SEQUENCE ERROR?
040452  001030                          BNE     TS401-10        ;BR TO ERROR HALT ON SEQ ERROR
040454  005767  177264                  TST     PROFTE
040460  001031                          BNE     NODL2
040462  122767  000001  137630          CMPB    #APTENV,$ENV    ;RUNNING IN APT MODE?
040470  001003                          BNE     1$              ;IF NO DO TEST.
040472  005767  137610                  TST     $PASS           ;IF YES THEN ARE WE ON FIRST PASS?
040476  001022                          BNE     NODL2           ;IF IN APT MODE AND FIRST PASS, SKIP TEST.
040500  016700  137056          1$:     MOV     TKB,R0          ;MAKE SURE RECEIVER DONE IS SET
040504  012767  000100  137046          MOV     #100,TRCSR      ;SET INTERRUPT ENABLE
040512  000005                          RESET                   ;SHOULD CLEAR INTERRUPT ENABLE
040514  032767  000100  137036          BIT     #100,TRCSR      ;TEST FOR CLEAR
040522  001410                          BEQ     TS401
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 753           <====
040524  012742  001134                  MOV     #1134,-(R2)     ;MOVE TO MAILBOX #  *******  1134  *******
040530  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040532  000000                          HALT                    ;RESET FAILED TO CLEAR TRCSR
                                                                ;  OR SEQUENCE ERROR
040534  012742  001135                  MOV     #1135,-(R2)     ;MOVE TO MAILBOX #  *******  1135  *******
040540  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040542  000000                          HALT                    ; WRONG $TSTNM
040544                          NODL2:
                                ;*******************************************************************
                                ;TEST 401       TEST THAT RESET HAS NO EFFECT ON THE TRACE TRAP
                                ;*******************************************************************
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040544  005212                          T401    TEST THAT RESET HAS NO EFFECT ON THE TRACE TRAP
040546  022712  000401                  TS401:  INC     (R2)            ;UPDATE TEST NUMBER
040552  001023                                  CMP     #401,(R2)       ;SEQUENCE ERROR?
040554  122767  000001  137536                  BNE     RESET3          ;BR TO ERROR HALT ON SEQ ERROR
040562  001003                                  CMPB    #APTENV,$ENV    ;RUNNING IN APT MODE?
040564  005767  137516                          BNE     2$              ;IF NO DO TEST.
040570  001027                                  TST     $PASS           ;IF YES THEN ARE WE ON FIRST PASS?
040572  012706  001000                          BNE     SKTST2          ;IF IN APT MODE AND FIRST PASS, SKIP TEST.
040576  012767  040632  137210          2$:     MOV     #BUFF,%6        ;SET STACK
040604  012746  000020                          MOV     #RESET2,14      ;SET UP TRACE VECTOR
040610  012746  040616                          MOV     #20,-(R6)       ;SET THE T-BIT ON STACK
040614  000006                                  MOV     #1$,-(R6)       ;MOVE NEW PC ON STACK
040616  000005                          1$:     RTT
040620  000005                                  RESET                   ;SHOULD HAVE NO EFFECT
040622                                  RESET3: RESET                   ;NO EFFECT
040622  012742  001136                          MOV     #1136,-(R2)     ;MOVE TO MAILBOX #  *******  1136  *******
040626  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040630  000000                                  HALT                    ;TRACE TRAP FAILED,OR WRONG $TSTNM
040632  005067  137140                  RESET2: CLR     STATUS          ;CLEAR TRACK
040636  005067  137154                          CLR     16              ;TRACE STATUS
040642  012767  000016  137144                  MOV     #16,14
040650                                  SKTST2:
                                        ;*******************************************************************
                                        ;TEST 402       TEST THAT WHEN TTY INTERRUPTS IT POPS NEW STATUS
                                        ;*******************************************************************
040650  005212                          TS402:  INC     (R2)            ;UPDATE TEST NUMBER
040652  022712  000402                          CMP     #402,(R2)       ;SEQUENCE ERROR?
040656  001060                                  BNE     TTY11           ;BR TO ERROR HALT ON SEQ ERROR
040660  005767  177060                          TST     PROFTE
040664  001063                                  BNE     NODL3
040666  122767  000001  137424                  CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
040674  001003                                  BNE     2$                      ;IF NOT, DO THIS TEST
040676  005767  137404                          TST     $PASS                   ;IS THIS THE FIRST PASS?
040702  001054                                  BNE     NODL3                   ;IF NOT FIRST PASS, SKIP TEST
040704                                  2$:
040704  000005                                  RESET
040706  012706  001000                          MOV     #BUFF,%6        ;SET UP STACK
040712  012767  040740  137144                  MOV     #TTY3,64        ;INTERRUPT VECTOR
040720  005067  137052                          CLR     STATUS          ;DROP PROCESSOR PRIORITY
040724  012767  000357  137134                  MOV     #357,66         ;HIGH PRIORITY ON INTERRUPT
040732  052767  000300  136624                  BIS     #300,TTCSR      ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
040740  026727  137032  000357  TTY3:   CMP     STATUS,#357
040746  001404                                  BEQ     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <===
                                                                        ;           CONDITIONAL BRANCH INST. AND    <=
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <
                                                                        ;           WHICH FOLLOWS W/ 743            <
040750  012742  001137                          MOV     #1137,-(R2)     ;MOVE TO MAILBOX #  *******  1137  *******
040754  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040756  000000                                  HALT                    ;INTERRUPT DID NOT POP CORRECT STATUS
040760  000005                          1$:     RESET                   ;CLR NTERRUPT ENABLE
040762  012706  001000                          MOV     #BUFF,%6        ;STACK SET UP
040766  012767  041012  137070                  MOV     #TTY4,64        ;INTERRUPT VECTOR
040774  005067  137066                          CLR     66              ;CLR NEW STATUS
041000  012767  000157  136770                  MOV     #157,STATUS     ;PROCESSOR STATUS
041006  105167  136552                          COMB    TTCSR           ;SET INTERRUPT ENABLE
```

```
041012  005767  136760          TTY4:   TST     STATUS
041016  001404                          BEQ     TTT37
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 717           <====
041020                          TTY11:
041020  012742  001140                  MOV     #1140,-(R2)     ;MOVE TO MAILBOX #  *******  1140  *******
041024  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041026  000000                          HALT                    ;INCORRECT STATUS,OR WRONG $TSTNM
041030  105167  136530          TTT37:  COMB    TTCSR
041034                          NODL3:

                                ;*******************************************************************
                                ;TEST 403       TEST THE 'WAIT' INSTRUCTION
                                ;*******************************************************************
041034  005212                  TS403:  INC     (R2)            ;UPDATE TEST NUMBER
041036  022712  000403                  CMP     #403,(R2)       ;SEQUENCE ERROR?
041042  001062                          BNE     STP4            ;BR TO ERROR HALT ON SEQ ERROR
041044  122767  000001  137246          CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
041052  001003                          BNE     1$                      ;IF NOT, DO THIS TEST
041054  005767  137226                  TST     $PASS                   ;IS THIS THE FIRST PASS?
041060  001057                          BNE     STP4E                   ;IF NOT FIRST PASS, SKIP TEST
041062                          1$:
041062  042767  000100  136474          BIC     #100,TPS        ;CLEAR INTERRUPT ENABLE
041070  012706  001000                  MOV     #BUFF,SP        ;SET UP THE STACK
041074  012767  041162  136762          MOV     #WATE,64        ;SET UP THE INTERRUPT VECTOR
041102  005067  136760                  CLR     66
041106  105767  136452          WATE1:  TSTB    TPS             ;WAIT FOR READY
041112  100375                          BPL     WATE1           ;TO BE UP
041114  012767  000015  136444          MOV     #15,TPB         ;DO A CARRIAGE RETURN
041122  105767  136436          WATE2:  TSTB    TPS             ;WAIT FOR READY TO COME UP
041126  100375                          BPL     WATE2
041130  012767  000015  136430          MOV     #15,TPB         ;DO ANOTHER CARRIAGE RETURN
041136  052767  000100  136420          BIS     #100,TPS        ;SET THE INTERRUPT ENABLE
041144  005067  136626                  CLR     STATUS          ;CLEAR THE PSW
041150  000001                  WATE3:  WAIT                    ;WAIT FOR THE INTERRUPT
041152  012742  001141                  MOV     #1141,-(R2)     ;MOVE TO MAILBOX #  *******  1141  *******
041156  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041160  000000                          HALT                    ;WAIT INSTRUCTION DID NOT LOOP
041162  005767  136610          WATE:   TST     STATUS  ;IS THE PSW CORRECT?
041166  001404                          BEQ     1$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 725           <
041170  012742  001142                  MOV     #1142,-(R2)     ;MOVE TO MAILBOX #  *******  1142  *******
041174  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041176  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
041200  026727  137570  041152  1$:     CMP     BUFF-4,#WATE3+2 ;IS THE OLD PC SAVED
041206  001404                          BEQ     STP4E
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <=-
                                                        ;           CONDITIONAL BRANCH INST. AND   <--
                                                        ;           REPLACE THE MOVE INSTRUCTION   <=-
                                                        ;           WHICH FOLLOWS W/ 715           <
041210                          STP4:
```

```
041210  012742  001143                  MOV     #1143,-(R2)      ;MOVE TO MAILBOX #  *******  1143  *******
041214  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
041216  000000                          HALT                     ;OLD PC WAS NOT SAVED OR WRONG $TESTN
041220                          STP4E:
                                ;*****************************************************************************
                                ;TEST 404       TEST THAT USING REGISTER ADDR (177700) CAUSES TIME OUT.
                                ;*****************************************************************************
041220  005212                  TS404:  INC     (R2)             ;UPDATE TEST NUMBER
041222  022712  000404                  CMP     #404,(R2)        ;SEQUENCE ERROR?
041226  001017                          BNE     TS405-10         ;BR TO ERROR HALT ON SEQ ERROR
                                        ;
                                        ;REGISTER ADDRESS (177700-177717) CAUSE TIME OUT WHEN USED
                                        ;AS PROGRAM ADDRESS BY THE CPU.
                                        ;
041230  012706  001000                  MOV      #BUFF,SP        ;SET  STACK POINTER
041234  012737  041256  000004          MOV      #RETR1,@#RTRAP5;SET TRAP RETURN ADDR
041242  005737  177700          PCN1:   TST      @#177700        ;BAD ADDR REFERENCE, TRAP TO 4
041246  012742  001144                  MOV     #1144,-(R2)      ;MOVE TO MAILBOX #  *******  1144  *******
041252  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
041254  000000                          HALT                     ;REFERENCING 177700 DID NOT CAUSE TIME OUT
041256  022767  041246  137510  RETR1:  CMP     #PCN1+4,BUFF-4   ;PROPER PC STORED ON STACK?
041264  001404                          BEQ     TS405
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                                 ;           CONDITIONAL BRANCH INST. AND   <
                                                                 ;           REPLACE THE MOVE INSTRUCTION   <
                                                                 ;           WHICH FOLLOWS W/ 760           <
041266  012742  001145                  MOV     #1145,-(R2)      ;MOVE TO MAILBOX #  *******  1145  *******
041272  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
041274  000000                          HALT                     ;OLD PC WAS NOT SAVED IN STACK
                                                                 ;  OR SEQUENCE ERROR

                                ;*****************************************************************
                                ;ODD ADDRESS USED BY A 'WORD'' INSTRUCTION SHOULD NOT
                                ;CAUSE A TRAP, BUT THE LOW ORDER ADDRESS BIT WOULD BE IGNORED.
                                ;*****************************************************************************
                                ;TEST 405       TEST ODD ADDRESS TRAP IS NOT IMPLEMENTED.
                                ;*****************************************************************************
041276  005212                  TS405:  INC     (R2)             ;UPDATE TEST NUMBER
041300  022712  000405                  CMP     #405,(R2)        ;SEQUENCE ERROR?
041304  001013                          BNE     TS406-10         ;BR TO ERROR HALT ON SEQ ERROR
                                ;
041306  012737  041334  000004          MOV     #RETR2,@#RTRAP5 ;SET TRAP RETURN ADDR
041314  005037  000000                  CLR     @#0              ;PUT ALL 0 IN LOC 0
041320  005337  000001                  DEC     @#1              ;DECREMENT ODD ADDRESS, SHOULD NOT TRAP
041324  022737  177777  000000          CMP     #-1,@#0          ;WORD LOC 0 HAS ALL ONES?
041332  001404                          BEQ     TS406
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <--
                                                                 ;           CONDITIONAL BRANCH INST. AND   <-=
                                                                 ;           REPLACE THE MOVE INSTRUCTION   <--
                                                                 ;           WHICH FOLLOWS W/ 764           <  -=
041334                          RETR2:
041334  012742  001146                  MOV     #1146,-(R2)      ;MOVE TO MAILBOX #  *******  1146  *******
041340  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
041342  000000                          HALT                     ;LOC 0 DID NOT STORE -1,OR ODD ADDR REFERENCE CAUSE TRAP
                                                                 ;  OR SEQUENCE ERROR
```

```
                                        ;*************************************************************
                                        ;
                                        ;USING ADDRESS 177700 IN MODE 2, CAUSES BUS ERROR, BUT
                                        ;THE REGISTER IN USE WILL BE INCREMENTED.
                                        ;
                                        ;*****************************************************************************
                                        ;TEST 406       TEST THAT IN MODE 2, BAD ADDRESS REFERENCE CAUSES BUS ERROR.
                                        ;*****************************************************************************
041344  005212                          TS406:  INC     (R2)            ;UPDATE TEST NUMBER
041346  022712  000406                          CMP     #406,(R2)       ;SEQUENCE ERROR?
041352  001016                                  BNE     TS407-10        ;BR TO ERROR HALT ON SEQ ERROR
041354  012737  041402  000004                  MOV     #RETR3,@#RTRAP5 ;SET TRAP RETURN ADDR
041362  012700  177700                          MOV     #177700,R0      ;STORES BAD MEMORY REFERENCE
041366  012720  001234                          MOV     #1234,(R0)+     ;BAD ADDR REFERENCE, TRAP TO LOC 4
041372  012742  001147                          MOV     #1147,-(R2)     ;MOVE TO MAILBOX #  *******  1147  *******
041376  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041400  000000                                  HALT                    ;ADDRESSING 177700 DID NOT CAUSE TRAP
041402  022700  177702                  RETR3:  CMP     #177702,R0      ;WAS R0 INCREMENTED?
041406  001404                                  BEQ     TS407
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <-
                                                                        ;           CONDITIONAL BRANCH INST. AND   <=
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <-
                                                                        ;           WHICH FOLLOWS W/ 761           <-
041410  012742  001150                          MOV     #1150,-(R2)     ;MOVE TO MAILBOX #  *******  1150  *******
041414  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041416  000000                                  HALT                    ;R0 WAS NOT INCREMENTED
                                                                        ;  OR SEQUENCE ERROR
                                        ;*************************************************************
                                        ;
                                        ;AFTER THE FIRST BUS ERROR WAS ENCOUNTERED, AN ATTEMPT WAS MADE
                                        ;TO PUSH PC AND PS INTO THE STACK. HOWEVER, IF THE STACK POINTER
                                        ;WAS BAD, A BOUBLE BUS ERROR OCCURED.  THE STACK POINTER WOULD
                                        ;THEN BE SET TO LOCATION 4, OLD PC AND PS WERE PUSHED INTO
                                        ;LOCATIONS 0 AND 2. THE PROCESSOR WOULD TRAP TO 4 AND CONTINUE
                                        ;EXECUTION.
                                        ;
                                        ;*****************************************************************************
                                        ;TEST 407       TEST FOR DOUBLE BUS ERROR.
                                        ;*****************************************************************************
041420  005212                          TS407:  INC     (R2)            ;UPDATE TEST NUMBER
041422  022712  000407                          CMP     #407,(R2)       ;SEQUENCE ERROR?
041426  001062                                  BNE     TS410-10        ;BR TO ERROR HALT ON SEQ ERROR
041430  012737  041506  000004                  MOV     #DBE1,@#RTRAP5  ;SET TRAP RETURN ADDR
041436  012737  000340  000006                  MOV     #340,@#6        ;SET UP PS
041444  012737  041476  000010                  MOV     #DBE2,@#RTRAP   ;SET TRAP RETURN ADDR
041452  012737  000340  000012                  MOV     #340,@#12       ;SET UP PS
041460  012706  177700                          MOV     #177700,SP      ;SET ILLEGAL SP
041464  000077                          DBE:    TRAPA                   ;ILLEGAL INSTRUCTION
041466  012742  001151                          MOV     #1151,-(R2)     ;MOVE TO MAILBOX #  *******  1151  *******
041472  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041474  000000                                  HALT                    ;DOUBLE BUS ERROR DID NOT CAUSE TRAP
041476                                  DBE2:
041476  012742  001152                          MOV     #1152,-(R2)     ;MOVE TO MAILBOX #  *******  1152  *******
041502  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041504  000000                                  HALT                    ;TRAP TO WRONG LOCATION
041506  022737  041466  000000          DBE1:   CMP     #DBE+2,@#0      ;OLD PC GOT SAVED?
```

```
041514  001404                          BEQ     DBE3
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 744           <====
041516  012742  001153                  MOV     #1153,-(R2)     ;MOVE TO MAILBOX #  *******  1153  *******
041522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041524  000000                          HALT                    ;OLD PC DID NOT GET SAVEDD
041526  022737  000340  000002  DBE3:   CMP     #340,@#2        ;CORRECT PS SAVED?
041534  001404                          BEQ     DBE4
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 734           <====
041536  012742  001154                  MOV     #1154,-(R2)     ;MOVE TO MAILBOX #  *******  1154  *******
041542  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041544  000000                          HALT                    ;CORRECT PS DID NOT GET SAVE
041546  022706  000000          DBE4:   CMP     #0,SP           ;SP POINTS TO LOC 0?
041552  001404                          BEQ     DBE5
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 725           <====
041554  012742  001155                  MOV     #1155,-(R2)     ;MOVE TO MAILBOX #  *******  1155  *******
041560  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041562  000000                          HALT                    ;SP IS NOT POINTING TO LOC 0
041564  012737  027324  000004  DBE5:   MOV     #T04,@#RTRAP5   ;RESET TIMEOUT VECTOR
041572  012737  027334  000010          MOV     #T010,@#RTRAP   ;RESET ILLEGAL INST. VECTOR
041600  012706  001000                  MOV     #STBOT,SP       ;RESET SP


                                ;*******************************************************************
                                ;TEST 410       TEST MFPT
                                ;*******************************************************************
041604  005212                  TS410:  INC     (R2)            ;UPDATE TEST NUMBER
041606  022712  000410                  CMP     #410,(R2)       ;SEQUENCE ERROR?
041612  001023                          BNE     TS411-10        ;BR TO ERROR HALT ON SEQ ERROR
                                ;THIS TESTS THE MFPT INSTRUCTION- MOVE FROM PROCESSOR TYPE
                                ;UPON EXECUTION, R0 WILL RECEIVE THE PROCESSOR MODEL CODE
                                ;WHICH IS ''000003'' FOR F11.
        000007                  MFPT=000007
041614  012706  001000                  MOV     #STBOT,R6       ;INIT. SP
041620  013746  000010                  MOV     @#10,-(SP)      ;SAVE TRAP VECTOR
041624  012737  041654  000010          MOV     #1$,@#10        ;SET UP ILLEGAL INSTRUCTION TRAP
041632  010046                          MOV     R0,-(SP)        ;SAVE R0
041634  000007                          MFPT                    ;GET PROCESSOR MODEL
041636  010037  041664                  MOV     R0,@#CPUTYP     ;STORE IT
041642  012600                          MOV     (SP)+,R0        ;RESTORE R0
041644  022737  000003  041664          CMP     #3,@#CPUTYP     ;CHECK MODEL TYPE
041652  001405                          BEQ     XXT
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <
                                                        ;           CONDITIONAL BRANCH INST. AND   <
                                                        ;           REPLACE THE MOVE INSTRUCTION   <
                                                        ;           WHICH FOLLOWS W/ 757           <
041654                          1$:
041654  012742  001156                  MOV     #1156,-(R2)     ;MOVE TO MAILBOX #  *******  1156  *******
```

```
041660  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041662  000000                          HALT                    ;ILLEGAL INSTR TRAP OR WRONG MODEL TYPE

041664  000000                  CPUTYP: .WORD   0
041666                          XXT:
041666  012637  000010                  MOV     (SP)+,@#10      ;RESTORE TRAP VECTOR
                                ;*******************************************************
                                ;THIS TEST WILL CHECK THE SERVICE ROUTINE FOR A CONTROL CHIP ERROR.
                                ;THIS IS DONE BY EXECUTING INSTRUCTIONS WHICH JUMP TO NON-EXISTENT
                                ;CONTROL-CHIP. THE TEST THEREFORE DOES A "FIS" INSTRUCTION. THE
                                ;CTLERR TRAPS TO LOCATION 10.
                                ;THE RESET LINE IS ALSO ASSERTED FOR 1 CYCLE.
                                ;*******************************************************************
                                ;TEST 411       TEST CTLERR SERVICE ROUTINE
                                ;*******************************************************************
041672  005212                  TS411:  INC     (R2)            ;UPDATE TEST NUMBER
041674  022712  000411                  CMP     #411,(R2)       ;SEQUENCE ERROR?
041700  001013                          BNE     TS412-10        ;BR TO ERROR HALT ON SEQ ERROR
041702  012706  001000                  MOV     #STBOT,R6       ;INIT STACK POINTER
041706  012737  041734  000010          MOV     #1$,@#10                ;SET UP RETURN ADDR FROM TRAP
041714  012737  000340  000012          MOV     #340,@#12       ;SET TRAP PRIORITY=7
041722  075006                          FADD    R6              ;EXECUTE FIS INSTR..SHOULD CAUSE CTLERR
041724  012742  001157                  MOV     #1157,-(R2)     ;MOVE TO MAILBOX #  *******  1157  *******
041730  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041732  000000                          HALT                    ;
041734  012706  001000          1$:     MOV     #STBOT,R6       ;RE-INIT STACK POINTER

                                ;*******************************************************************
                                ;TEST 412       TEST THAT ALL RESERVED INSTRUCTIONS TRAP
                                ;*******************************************************************
041740  005212                  TS412:  INC     (R2)            ;UPDATE TEST NUMBER
041742  022712  000412                  CMP     #412,(R2)       ;SEQUENCE ERROR?
041746  001140                          BNE     RET4            ;BR TO ERROR HALT ON SEQ ERROR
041750  042767  000100  135606          BIC     #100,TPS
041756  012737  042004  000244          MOV     #TRAP244,@#244  ; SET UP TO SEE IF
041764  013767  000010  000044          MOV     @#10,TENSAVE    ;  THIS PROCESSOR HAS THE
041772  012737  042014  000010          MOV     #TRAP10,@#10    ;  FLOATING POINT OPTION
042000  170007                          .WORD   170007          ; AN ILLEGAL FPP INSTRUCTION
042002  000416                          BR      AROUND          ; THE FOLLOWING
042004                          TRAP244:                        ; IF FPP IN--
042004  013767  042402  000400          MOV     @#FPP,FINISH    ;  RESET END OF TABLE POINTER
042012  000002                          RTI                     ; AND RETURN
042014                          TRAP10:                         ; LEAVE THE TABLE ALONE
042014  000002                          RTI                     ; AND RETURN
                                ;* IF NO CIS OPTION TRAP TO HERE
042016  042777  000004  165430  CISTRP: BIC     #4,@SWR         ;CLEAR CIS OPTION BIT IN SWR
042024  012716  042072                  MOV     #CONCIS,(SP)    ;CHANGE RETURN ADDRESS TO CONCIS LOCATION
042030  000002                          RTI                     ;RETURN

042032  000000                  CISADR: .WORD   0               ;DATA FOR CIS INSTRUCTION
042034  000000                          .WORD   0

042036  000000                  TENSAVE:.WORD   0               ; A PLACE TO STORE CONTENTS OF 10

042040                          AROUND:                         ;  CONTINUATION POINT
042040  012737  000246  000244          MOV     #246,@#244      ;  RESTORE THE TRAP VECTOR
```

```
042046  012737  042016  000010          MOV     #CISTRP,@#10    ;SET UP TO SEE IF
                                                                ; THIS PROCESSOR HAS THE CIS OPTION
042054  076144                          .WORD   076144          ;  EXECUTE A CMPCI INSTRUCTION
042056  042032                          .WORD   CISADR          ;     OPERANDS
042060  042032                          .WORD   CISADR          ;              FOR CIS
042062  000000                          .WORD   0               ;                      INSTRUCTION
042064  052777  000004  165362          BIS     #4,@SWR         ;  SET CIS PRESENT FLAG IN SWR
042072                          CONCIS:
042072  016737  177740  000010          MOV     TENSAVE,@#10    ; RESTORE THE ILLEGAL INST. VECTOR
042100  012703  042272                  MOV     #TABLE,TAB      ;TABLE POINTER
042104  012305                  GIN1:   MOV     (TAB)+,FIRST    ;FIRST OR CURRENT INSTRUCTION
042106  012301                          MOV     (TAB)+,LAST     ;LAST INSTRUCTION OR GROUP
042110  020537  042346                  CMP     FIRST,@#CIS     ;HAVE WE TESTED UP TO THE CIS INSTRUCTION SPACE
042114  001007                          BNE     1$              ;IF NO CONTINUE TESTING
042116  032777  000004  165330          BIT     #4,@SWR         ;IF YES,CHECK IF CIS CHIPS PRESENT
042124  001403                          BEQ     1$              ;IF THEY ARE NOT CONTINUE TESTING
042126  012703  042402                  MOV     #FPP,TAB        ;IF CIS HERE SKIP CIS INSTRUCTION SPACE
042132  000764                          BR      GIN1
042134  020567  000252          1$:     CMP     FIRST,FINISH    ;TESTED ALL
042140  001415                          BEQ     GIN3            ;YES BRANCH
042142  010567  000246                  MOV     FIRST,INST      ;SET UP INST
042146  005267  000242          GIN2:   INC     INST
042152  012767  042204  135630          MOV     #RET,10         ;SET UP RETURN FROM TRAP
042160  012706  001000                  MOV     #BUFF,SP        ;SET UP STACK POINTER
042164  005067  135606                  CLR     CC              ;CLEAR PRIORITY
042170  000167  000220                  JMP     INST            ;EXECUTE RESERVED INSTRUCTION
042174  012700  000370          GIN3:   MOV     #370,R0         ;RESET RESERVED AREA 370-402
042200  000167  000320                  JMP     THRPRT          ;JUMP TO EIS TEST

                                ;TRAPPING SHOULD SEND YOU HERE
042204  020627  000774          RET:    CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
042210  001404                          BEQ     RET1
042212  012742  001160                  MOV     #1160,-(R2)     ;MOVE TO MAILBOX #  *******  1160  *******
042216  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042220  000000                          HALT                    ;WRONG DECREMENT
042222  026727  136546  042416  RET1:   CMP     BUFF-4,#INST+2  ;LOC OF INST UNINCREMENTED
042230  001404                          BEQ     RET2
042232  012742  001161                  MOV     #1161,-(R2)     ;MOVE TO MAILBOX #  *******  1161  *******
042236  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042240  000000                          HALT                    ;INST INC ON TRAP
042242  005767  136530          RET2:   TST     BUFF-2
042246  001404                          BEQ     RET3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <
                                                                ;           CONDITIONAL BRANCH INST. AND    <
                                                                ;           REPLACE THE MOVE INSTRUCTION    <-
                                                                ;           WHICH FOLLOWS W/ 637            <-
042250                          RET4:
042250  012742  001162                  MOV     #1162,-(R2)     ;MOVE TO MAILBOX #  *******  1162  *******
042254  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042256  000000                          HALT                    ;CONDITION CODES SET ON TRAP OR WRONG $TSTNM
042260  026701  000130          RET3:   CMP     INST,LAST
042264  001707                          BEQ     GIN1            ;SET UP NEW GROUP
042266  000167  177654                  JMP     GIN2            ;FINISH OLD GROUP
                                                                ;END OF INSTRUCTION GROUP
042272  000007                  TABLE:  7                       ;END OF OPERATE
042274  000077                          77
```

```
11482  042276  000207                    207                    ;RTS,RT1,JMP
11483  042300  000227                    227
11484  042302  006777                    6777
11485  042304  007777                    7777
11486  042306  075037                    075037
11487  042310  076017                    76017
11488  042312  076032                    76032
11489  042314  076037                    76037
11490  042316  076045                    76045
11491  042320  076047                    76047
11492  042322  076077                    76077
11493  042324  076127                    76127
11494  042326  076132                    76132
11495  042330  076137                    76137
11496  042332  076145                    76145
11497  042334  076147                    76147
11498  042336  076157                    76157
11499  042340  076167                    76167
11500  042342  076177                    76177
11501  042344  076777                    76777
11502  042346  076017            CIS:    76017
11503  042350  076032                    76032
11504  042352  076037                    76037
11505  042354  076045                    76045
11506  042356  076047                    76047
11507  042360  076077                    76077
11508  042362  076127                    76127
11509  042364  076132                    76132
11510  042366  076137                    76137
11511  042370  076145                    76145
11512  042372  076147                    76147
11513  042374  076157                    76157
11514  042376  076167                    76167
11515  042400  076177                    76177
11516  042402  167777            FPP:    167777                 ;  START OF THE FPP INSTRUCTIONS
11517  042404  177700                    177700
11518  042406  177716                    177716
11519  042410  177777                    177777
11520  042412  042412            FINISH: .                      ;END FLAG
11521  042414  000000            INST:   HALT                   ;WILL CONTINUE RESERVED INST
11522  042416  000000                    HALT                   ;SHOULD TRAP TO LOC 10
11523  042420  000000                    HALT                   ;LOC 10 SHOULD SEND YOU TO
11524  042422  000000                    HALT                   ;RET
11525  042424  000000                    HALT
```

```
                                .SBTTL ** STARTING OF EIS TEST **
        000000                  .REPT   0


                                        PART THREE:             EIS INSTRUCTION TESTS


                                        ABSTRACT

                                        THIS PROGRAM TESTS THE F11 EXTENDED INSTRUCTION SET
                                        <ASH, ASHC, MUL, AND DIV> USING REGISTERS 0-5 AT-
                                        LEAST ONCE WITH EACH INSTRUCTION.



                                        SWITCH SETTINGS

                                        IF NO HARDWARE SWITCH REGISTER IS AVAILABLE, THE PROGRAM
                                        AUTOMATICALLY USES THE CONTENTS OF LOC. 176 AS THE SOFTWARE
                                        SWITCH REGISTER.  THE USER SHOULD SET THIS LOCATION BEFORE
                                        STARTING THE PROGRAM.


                                        BIT #   OCTAL VALUE               FUNCTION

                                        15      100000............ HALT ON ERROR
                                        13      020000............ INHIBIT ERROR PRINTOUT

                                        AN 8 BIT BYTE $ENVM [I.E. LOCATION 321] HAS BEEN USED TO DEFINE
                                        THE OPERATING MODE. ALL TYPEOUTS CAN BE SUPPRESSED BY MAKING
                                        BIT 5 OF BYTE $ENVM HIGH, IN OTHER WORDS BY PLACING A 20000 IN
                                        LOCATION 320

                                .ENDR
```

```
                 000000                    DUMMY=   0
                 000001                    ERRNM=   1
                 000051                    F=       5
                 000176                    N=       176
                 001000                    SW09=    1000
                 002000                    SW10=    2000
                 004000                    SW11=    4000
                 010000                    SW12=    10000

042426                                     COUNT:
                 042430                              .=COUNT+2
042430                                     PSWORD:
                 042432                              .=PSWORD+2
042432                                     TEMP1:
                 042434                              .=TEMP1+2
042434                                     TEMP2:
                 042436                              .=TEMP2+2
042436                                     TEMP3:
                 042440                              .=TEMP3+2
042440                                     TEMP4:
                 042442                              .=TEMP4+2
042442           000000                    TEMP5:   .WORD
042444           000000                    TEMP6:   .WORD
042446              000                    TYPCNT:  .BYTE
042447              000                    $TPCNT:  .BYTE
042450           000007                    S0:      7
042452           177771                    S1:      -7
042454           042452                    S2:      S1
042456           177772                    S3:      -6
042460           177777                    S4:      -1
042462           040000                    S5:      40000
042464           042462                    S6:      S5
042466           040000                    S7:      40000
042470           177776                    S8:      -2
042472           000002                    S9:      2
042474           042472                    S10:     S9
042476           000002                    S11:     2
042500           000064                    TTYOUT:  64
042502           177566                    $TPB:    177566
042504           177564                    $TPS:    177564
042506           005015   020040   000040  $CRLF:   .ASCIZ  <15><12>/   /
042514           006412   047520   042527  POWER:   .ASCIZ  <12><15>/POWER/
042522           000122

042524           012705   000304          THRPRT:  MOV     #$TESTN,R5      ;MAKE R5 POINT TO THE LOCATION $TESTN
```

```
042530  005037  042426                  CLR     @#COUNT         ;CLEAR THE COUNTER
042534  012715  000001                  MOV     #1,(R5)         ;INITIALIZE TEST NUMBER
042540  012706  001000                  MOV     #STBOT,SP       ;** STACK AT STBOT **
042544  012737  000001  042432          MOV     #1,@#TEMP1      ;TEMP1=1
042552  005037  042434                  CLR     @#TEMP2         ;TEMP2=0
042556  012737  000001  042436          MOV     #1,@#TEMP3      ;TEMP3=1
042564  005037  042440                  CLR     @#TEMP4         ;TEMP4=0
042570  012737  062470  000034          MOV     #$TRAP, @#34    ;SET UP TRAP INSTRUCTION VECTOR
042576  012737  000340  000036          MOV     #340, @#36      ;AND VECTOR PLUS TWO
042604  106427  000000                  MTPS    #0              ;CLEAR PROCESSOR PRIORITY BITS IN PSW
```

```
                                                        ;*******************************
                                                        ;     ASH INSTRUCTION TESTS
                                                        ;*******************************



                                                                ;************
                                                                ; TESTS 1-36
                                                                ;************


042610  010767  135356          ASTART: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
042614  013700  042432                  MOV     @#TEMP1,%0      ;LOAD R0 WITH THE CONTENTS OF TEMP1
042620  032737  000001  000306          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
042626  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
042630  013701  042434                  MOV     @#TEMP2,R1      ;OTHERWISE EXECUTE THE INSTRUCTION
                                                                ;IN MODE 0 USING R1
042634  072001                          ASH     R1,R0
042636  000402                          BR      4$
042640  072067  177570          2$:     ASH     TEMP2,%0        ;SHIFT R0 BY THE NUMBER SPECIFIED BY TEMP2
042644  106737  042430          4$:     MFPS    @#PSWORD        ;SAVE PS
042650  123737  042440  042430          CMPB    @#TEMP4,@#PSWORD;IS THE PS - TEMP4 ?
042656  001403                          BEQ     .+10
042660  004767  016020                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
042664  000001                          1               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


042666  005237  042426                  INC     @#COUNT         ;INCREMENT THE COUNTER
042672  023700  042436                  CMP     @#TEMP3,%0      ;IS THE RESULT IN R0 EQUAL TO TEMP3?
042676  001403                          BEQ     .+10
042700                          6$:
042700  004767  016000                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;EITHER INCORRECT R0 OR INCORRECT SEQUENCE
042704  000002                          2               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


042706  021537  042426                  CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE
                                                                ;COUNTER?
042712  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
042714  005215                          INC     (R5)
042716  010767  135250                  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
042722  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                ;BY 14. AND RIGHT BY 14.?
042726  002011                          BGE     8$
042730  005237  042434                  INC     @#TEMP2
042734  006367  177476                  ASL     TEMP3           ;SHIFT TEMP3 LEFT.
042740  021527  000020                  CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
042744  001004                          BNE     REGR1
042746  000167  001010                  JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
042752  004767  001032          8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
042756  010767  135210          REGR1:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
042762  013701  042432                  MOV     @#TEMP1,%1      ;LOAD R1 WITH THE CONTENTS OF TEMP1
042766  032737  000001  000306          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
```

```
042774  001004                          BNE     2$                      ;IF NOT THEN GO TO 2$
042776  013702  042434                  MOV     @#TEMP2,R2              ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043002  072102                          ASH     R2,R1                   ;USING R1
043004  000402                          BR      4$
043006  072167  177422          2$:     ASH     TEMP2,%1                ;SHIFT R1 BY THE NUMBER SPECIFIED BY TEMP2
043012  106737  042430          4$:     MFPS    @#PSWORD                ;SAVE PS
043016  123737  042440  042430          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
043024  001403                          BEQ     .+10
043026  004767  015652                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 0
043032  000003                          3               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


043034  005237  042426                  INC     @#COUNT                 ;INCREMENT THE COUNTER
043040  023701  042436                  CMP     @#TEMP3,%1              ;IS THE RESULT IN R1 EQUAL TO TEMP3?
043044  001403                          BEQ     .+10
043046                          6$:
043046  004767  015632                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;EITHER INCORRECT R1 OR INCORRECT SEQUENCE
043052  000004                          4               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


043054  021537  042426                  CMP     (R5),@#COUNT            ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043060  001372                          BNE     6$                      ;IF NOT GO TO THE HLT ABOVE
043062  005215                          INC     (R5)
043064  010767  135102                  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
043070  021527  000037                  CMP     (R5),#37                ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                        ;BY 14. AND RIGHT BY 14.?
043074  002011                          BGE     8$
043076  005237  042434                  INC     @#TEMP2
043102  006367  177330                  ASL     TEMP3                   ;SHIFT TEMP3 LEFT
043106  021527  000020                  CMP     (R5),#20                ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043112  001004                          BNE     REGR2
043114  000167  000642                  JMP     NEGAT                   ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043120  004767  000664          8$:     JSR     PC,TST37                ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043124  010767  135042          REGR2:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
043130  013702  042432                  MOV     @#TEMP1,%2              ;LOAD R2 WITH THE CONTENTS OF TEMP1
043134  032737  000001  000306          BIT     #1,@#$PASS              ;IS IT AN EVEN PASS ?
043142  001004                          BNE     2$                      ;IF NOT THEN GO TO 2$
043144  013703  042434                  MOV     @#TEMP2,R3              ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043150  072203                          ASH     R3,R2                   ;USING R2
043152  000402                          BR      4$
043154  072267  177254          2$:     ASH     TEMP2,%2                ;SHIFT R2 BY THE NUMBER SPECIFIED BY TEMP2
043160  106737  042430          4$:     MFPS    @#PSWORD                ;SAVE PS
043164  123737  042440  042430          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
043172  001403                          BEQ     .+10
043174  004767  015504                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 0
043200  000005                          5               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


043202  005237  042426                  INC     @#COUNT
043206  023702  042436                  CMP     @#TEMP3,%2              ;IS THE RESULT IN R2 EQUAL TO TEMP3.
043212  001403                          BEQ     .+10
043214                          6$:
043214  004767  015464                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
                                                                ;EITHER INCORRECT R2 OR INCORRECT SEQUENCE
043220  000006                          6               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043222  021537  042426                  CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043226  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
043230  005215                          INC     (R5)
043232  010767  134734                  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
043236  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                ;LEFT BY 14, AND RIGHT BY 14.?
043242  002011                          BGE     8$
043244  005237  042434                  INC     @#TEMP2
043250  006367  177162                  ASL     TEMP3           ;SHIFTED TEMP3 LEFT
043254  021527  000020                  CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043260  001004                          BNE     REGR3
043262  000167  000474                  JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043266  004767  000516          8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043272  010767  134674          REGR3:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
043276  013703  042432                  MOV     @#TEMP1,%3      ;LOAD R3 WITH THE CONTENTS OF TEMP1
043302  032737  000001  000306          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
043310  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
043312  013704  042434                  MOV     @#TEMP2,R4      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043316  072304                          ASH     R4,R3           ;USING R3
043320  000402                          BR      4$
043322  072367  177106          2$:     ASH     TEMP2,%3        ;SHIFT R3 BY THE NUMBER SPECIFIED BY TEMP2
043326  106737  042430          4$:     MFPS    @#PSWORD        ;SAVE PS
043332  123737  042440  042430          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
043340  001403                          BEQ     .+10
043342  004767  015336                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0.
043346  000007                          7               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043350  005237  042426                  INC     @#COUNT
043354  023703  042436                  CMP     @#TEMP3,%3      ;IS THE RESULT IN R3 EQUAL TO TEMP3?
043360  001403                          BEQ     .+10
043362                          6$:
043362  004767  015316                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;EITHER INCORRECT R3 OR INCORRECT SEQUENCE
043366  000010                          10              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043370  021537  042426                  CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043374  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
043376  005215                          INC     (R5)
043400  010767  134566                  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
043404  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                ;LEFT BY 14, AND RIGHT BY 14.?
043410  002010                          BGE     8$
043412  005237  042434                  INC     @#TEMP2
043416  006367  177014                  ASL     TEMP3           ;SHIFT TEMP3 LEFT?
043422  021527  000020                  CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043426  001003                          BNE     REGR4
043430  000554                          BR      NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043432  004767  000352          8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043436  010767  134530          REGR4:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
```

```
043442  013704  042432                  MOV     @#TEMP1,%4        ;LOAD R4 WITH THE CONTENTS OF TEMP1
043446  010501                          MOV     R5,R1             ;SAVE R5
043450  032737  000001  000306          BIT     #1,@#$PASS        ;IS IT AN EVEN PASS ?
043456  001004                          BNE     2$                ;IF NOT THEN GO TO 2$
043460  013705  042434                  MOV     @#TEMP2,R5        ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043464  072405                          ASH     R5,R4             ;USING R4
043466  000402                          BR      4$
043470  072467  176740          2$:     ASH     TEMP2,%4          ;SHIFT R4 BY THE NUMBER SPECIFIED BY TEMP2
043474  106737  042430          4$:     MFPS    @#PSWORD          ;SAVE PS
043500  123737  042440  042430          CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
043506  001403                          BEQ     .+10
043510  004767  015170                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;THE PS IS NOT EQUAL TO 0
043514  000011                          11              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043516  005237  042426                  INC     @#COUNT
043522  023704  042436                  CMP     @#TEMP3,%4        ;IS THE RESULT IN R4 EQUAL TO TEMP3?
043526  001403                          BEQ     .+10
043530                          6$:
043530  004767  015150                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;EITHER INCORRECT R4 OR INCORRECT SEQUENCE
043534  000012                          12              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043536  010105                          MOV     R1,R5             ;RESTORE R5
043540  021537  042426                  CMP     (R5),@#COUNT      ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043544  001371                          BNE     6$                ;IF NOT GO TO THE HLT ABOVE
043546  005215                          INC     (R5)
043550  010767  134416                  MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
043554  021527  000037                  CMP     (R5),#37          ;HAS THE CONTENTS OF REGISTERS BEEN
                                                                  ;SHIFTED LEFT BY 14. AND RIGHT BY 14.?
043560  002010                          BGE     8$
043562  005237  042434                  INC     @#TEMP2
043566  006367  176644                  ASL     TEMP3             ;SHIFT TEMP3 LEFT
043572  021527  000020                  CMP     (R5),#20          ;HAS THE CONTENTS OF REGISTER BEEN SHIFTED BY 14.?
043576  001003                          BNE     REGR5
043600  000470                          BR      NEGAT             ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043602  004767  000202          8$:     JSR     PC,TST37          ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043606  010767  134360          REGR5:  MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
043612  010501                          MOV     R5,R1             ;SAVE R5
043614  013705  042432                  MOV     @#TEMP1,%5        ;LOAD R5 WITH THE CONTENTS OF TEMP1
043620  032737  000001  000306          BIT     #1,@#$PASS        ;IS IT AN EVEN PASS ?
043626  001004                          BNE     2$                ;IF NOT THEN GO TO 2$
043630  013700  042434                  MOV     @#TEMP2,R0        ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043634  072500                          ASH     R0,R5             ;USING R5
043636  000402                          BR      4$
043640  072567  176570          2$:     ASH     TEMP2,%5          ;SHIFT R5 BY THE NUMBER SPECIFIED BY TEMP2
043644  106737  042430          4$:     MFPS    @#PSWORD          ;SAVE PS
043650  123737  042440  042430          CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
```

```
043656  001403                          BEQ     .+10
043660  004767  015020                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 0.
043664  000013                          13              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043666  005237  042426                  INC     @#COUNT
043672  023705  042436                  CMP     @#TEMP3,%5      ;IS THE RESULT IN R5 EQUAL TO TEMP3?
043676  001403                          BEQ     .+10
043700                          6$:
043700  004767  015000                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;EITHER INCORRECT R5 OR INCORRECT SEQUENCE
043704  000014                          14              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043706  021137  042426                  CMP     (R1),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043712  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
043714  010105                          MOV     R1,R5           ;RESTORE R5
043716  005215                          INC     (R5)
043720  010767  134246                  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
043724  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
```

```
                                                                        ;LEFT BY 14. AND RIGHT BY 14.?
043730  002010                          BGE     8$                      ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043732  005237  042434                  INC     @#TEMP2
043736  006367  176474                  ASL     TEMP3                   ;SHIFT TEMP3 LEFT
043742  021527  000020                  CMP     (R5),#20                ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043746  001405                          BEQ     NEGAT                   ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043750  000402                          BR      10$
043752  004767  000032          8$:     JSR     PC,TST37
043756  000167  176626          10$:    JMP     ASTART                  ;GO BACK TO START
043762  012737  040000  042432  NEGAT:  MOV     #40000,@#TEMP1          ;TEMP1=40000
043770  012737  177762  042434          MOV     #177762,@#TEMP2         ;TEMP2=177762
043776  012737  000001  042436          MOV     #1,@#TEMP3              ;TEMP3=1
044004  000167  176600                  JMP     ASTART
044010  021527  000037          TST37:  CMP     (R5),#37                ;IS IT TEST 37?
044014  001013                          BNE     TST40                   ;IF NOT THEN TRY TEST 40
044016  005037  042432                  CLR     @#TEMP1                 ;0
044022  012737  000020  042434          MOV     #16.,@#TEMP2            ;SHIFTED BY 16
044030  005037  042436                  CLR     @#TEMP3                 ;IS=0
044034  012737  000004  042440          MOV     #4,@#TEMP4              ;AND PS=4
044042  000207                          RTS     PC
044044  021527  000040          TST40:  CMP     (R5),#40                ;IS IT TEST 40?
044050  001003                          BNE     TST41                   ;IF NOT THEN TRY TEST 41
044052  005037  042434                  CLR     @#TEMP2                 ;0 SHIFTED BY 0=0 AND PS=4
044056  000207                          RTS     PC
044060  021527  000041          TST41:  CMP     (R5),#41                ;IS IT TEST 41?
044064  001004                          BNE     TST42                   ;IF NOT THEN TRY TEST 42
044066  012737  177760  042434          MOV     #-16.,@#TEMP2           ;0 SHIFTED BY -16.=0 AND PS=4
044074  000207                          RTS     PC
044076  021527  000042          TST42:  CMP     (R5),#42                ;IS IT TEST 42?
044102  001013                          BNE     TST43                   ;IF NOT THEN TRY TEST 43
044104  012737  100000  042432          MOV     #100000,@#TEMP1         ;100000
044112  005237  042434                  INC     @#TEMP2                 ;SHIFTED BY -15
044116  005337  042436                  DEC     @#TEMP3                 ;IS=-1
044122  012737  000010  042440          MOV     #10,@#TEMP4                     ;AND PS=10
044130  000207                          RTS     PC
044132  021527  000043          TST43:  CMP     (R5),#43                ;IS IT TEST 43?
044136  001012                          BNE     TST44                   ;IF NOT THEN IF NOT THEN TRY TEST 44
044140  012737  125252  042432          MOV     #125252,@#TEMP1         ;125252
044146  012737  177777  042434          MOV     #-1,@#TEMP2             ;SHIFTED BY -1
044154  012737  152525  042436          MOV     #152525,@#TEMP3         ;IS=152525 AND PS=10
044162  000207                          RTS     PC
044164  021527  000044          TST44:  CMP     (R5),#44                ;IS IT TEST 44?
044170  001012                          BNE     TST45                   ;IF NOT THEN TRY TEST 45
044172  012737  000001  042434          MOV     #1,@#TEMP2              ;125252 SHIFTED BY 1
044200  012737  052524  042436          MOV     #52524,@#TEMP3          ;IS=52524
044206  012737  000003  042440          MOV     #3,@#TEMP4              ;AND PS=3
044214  000207                          RTS     PC
044216  021527  000045          TST45:  CMP     (R5),#45                ;IS IT TEST 45?
044222  001012                          BNE     TST46                   ;IF NOT THEN TRY TEST 46
044224  012737  177776  042434          MOV     #-2,@#TEMP2             ;125252 SHIFTED BY -2
044232  012737  165252  042436          MOV     #165252,@#TEMP3         ;IS=165252
044240  012737  000011  042440          MOV     #11,@#TEMP4             ;AND PS=11
044246  000207                          RTS     PC
044250  021527  000046          TST46:  CMP     (R5),#46                ;IS IT TEST 46?
044254  001014                          BNE     TST47                   ;IF NOT THEN TRY TEST 47
044256  012737  177777  042432          MOV     #-1,@#TEMP1             ;-1
```

```
044264  012737  000020  042434          MOV     #16.,@#TEMP2     ;SHIFTED BY 15.
044272  005037  042436                  CLR     @#TEMP3          ;IS=0
044276  012737  000007  042440          MOV     #7,@#TEMP4       ;AND PS=7
044304  000207                          RTS     PC
044306  021527  000047          TST47:  CMP     (R5),#47         ;IS IT TEST 47?
044312  001011                          BNE     TST50            ;IF NOT THEN TRY TEST 50
044314  005337  042434                  DEC     @#TEMP2          ;-1 SHIFTED BY 15
044320  012737  100000  042436          MOV     #100000,@#TEMP3  ;IS=100000
044326  012737  000011  042440          MOV     #11,@#TEMP4      ;AND PS=11
044334  000207                          RTS     PC
044336  021527  000050          TST50:  CMP     (R5),#50         ;IS IT TEST 50
044342  001007                          BNE     ENT51            ;IF NOT THEN TRY TEST 51
044344  012737  137777  042432          MOV     #137777,@#TEMP1  ;137777 SHIFTED BY 15. IS=100000
044352  012737  000013  042440          MOV     #13,@#TEMP4      ;AND PS=13
044360  000207                          RTS     PC
044362  021527  000051          ENT51:  CMP     (R5),#51         ;IS IT ENTERING TEST 51?
044366  001403                          BEQ     .+10
044370  004767  014310                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;TEST NUMBER GOOFED
044374  000015                          15              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


044376  005726                          TST     (SP)+            ;RESTORE STACK POINTER
044400  012704  177771                  MOV     #-7,%4
044404  012702  042452                  MOV     #S1,%2
044410  012703  042454                  MOV     #S2,%3
                                ;*******************************************************************
                                ;TEST:51        ASH     125252 SHIFTED BY #5 = 52500  PS = 3
                                ;*******************************************************************

044414  010767  133552          TST51:  MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
044420  012701  125252                  MOV     #125252,%1       ;LOAD R1 WITH 125252
044424  072127  000005                  ASH     #5,%1            ;SHIFT R1 BY #5
044430  106737  042430                  MFPS    @#PSWORD         ;SAVE PS
044434  122737  000003  042430          CMPB    #3,@#PSWORD      ;IS THE PS 3?
044442  001403                          BEQ     .+10
044444  004767  014234                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;THE PS IS NOT EQUAL TO 3
044450  000016                          16              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


044452  022701  052500                  CMP     #52500,%1        ;IS THE RESULT 52500?
044456  001403                          BEQ     .+10
044460                          1$:
044460  004767  014220                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;R1 IS NOT EQUAL TO 52500 OR INCORRECT SEQUENCE
044464  000017                          17              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


044466  021527  000051                  CMP     (R5),#51                 ;IS $TESTN = #51
044472  001372                          BNE     1$               ;IF NOT THEN GO TO HLT ABOVE
044474  005215                          INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:52      ASH     125252 SHIFTED BY @S2 = 177525  PS - 10
                                        ;*******************************************************************

044476  010767  133470                  TST52:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
044502  012700  125252                          MOV     #125252,%0      ;LOAD R0 WITH 125252
044506  072077  175742                          ASH     @S2,%0          ;SHIFT R0 BY @S2
044512  106737  042430                          MFPS    @#PSWORD        ;SAVE PS
044516  122737  000010  042430                  CMPB    #10,@#PSWORD    ;IS THE PS 10?
044524  001403                                  BEQ     .+10
044526  004767  014152                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044532  000020                                  20              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044534  022700  177525                          CMP     #177525,%0      ;IS THE RESULT 177525?
044540  001403                                  BEQ     .+10
044542                                  1$:
044542  004767  014136                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044546  000021                                  21              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044550  021527  000052                          CMP     (R5),#52                ;IS $TESTN = #52
044554  001372                                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
044556  005215                                  INC     (R5)


                                        ;*******************************************************************
                                        ;TEST:53      ASH     125252 SHIFTED BY @#S1 = 177525  PS - 10
                                        ;*******************************************************************

044560  010767  133406                  TST53:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
044564  012700  125252                          MOV     #125252,%0      ;LOAD R0 WITH 125252
044570  072037  042452                          ASH     @#S1,%0         ;SHIFT R0 BY @#S1
044574  106737  042430                          MFPS    @#PSWORD        ;SAVE PS
044600  122737  000010  042430                  CMPB    #10,@#PSWORD    ;IS THE PS 10?
044606  001403                                  BEQ     .+10
044610  004767  014070                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044614  000022                                  22              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044616  022700  177525                          CMP     #177525,%0      ;IS THE RESULT 177525?
044622  001403                                  BEQ     .+10
044624                                  1$:
044624  004767  014054                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044630  000023                                  23              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044632  021527  000053                          CMP     (R5),#53                ;IS $TESTN = #53
044636  001372                                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
044640  005215                                  INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:54      ASH     125252 SHIFTED BY (2)   177525  PS   10
                                        ;*******************************************************************

044642  010767  133324          TST54:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
044646  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
044652  072012                          ASH     (2),%0          ;SHIFT R0 BY (2)
044654  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
044660  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
044666  001403                          BEQ     .+10
044670  004767  014010                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
044674  000024                          24              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044676  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
044702  001403                          BEQ     .+10
044704                          1$:
044704  004767  013774                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044710  000025                          25              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044712  021527  000054                  CMP     (R5),#54                ;IS $TESTN - #54
044716  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
044720  005215                          INC     (R5)


                                        ;*******************************************************************
                                        ;TEST:55      ASH     125252 SHIFTED BY (2)+   177525  PS   10
                                        ;*******************************************************************

044722  010767  133244          TST55:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
044726  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
044732  072022                          ASH     (2)+,%0         ;SHIFT R0 BY (2)+
044734  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
044740  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
044746  001403                          BEQ     .+10
044750  004767  013730                  JSR     PC,$HLT,SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
044754  000026                          26              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044756  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
044762  001403                          BEQ     .+10
044764                          1$:
044764  004767  013714                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044770  000027                          27              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044772  021527  000055                  CMP     (R5),#55                ;IS $TESTN = #55
044776  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
```

```
045000  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:56        ASH     125252 SHIFTED BY -(2) = 177525  PS = 10
                                ;*******************************************************************

045002  010767  133164          TST56:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045006  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
045012  072042                          ASH     -(2),%0         ;SHIFT R0 BY -(2)
045014  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
045020  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
045026  001403                          BEQ     .+10
045030  004767  013650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
045034  000030                          30              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


045036  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
045042  001403                          BEQ     .+10
045044                          1$:
045044  004767  013634                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045050  000031                          31              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


045052  021527  000056                  CMP     (R5),#56                ;IS $TESTN   #56
045056  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
045060  005215                          INC     (R5)



                                ;*******************************************************************
                                ;TEST:57        ASH     125252 SHIFTED BY 2(3) - 177252  PS   11
                                ;*******************************************************************

045062  010767  133104          TST57:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045066  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
045072  072063  000002                  ASH     2(3),%0         ;SHIFT R0 BY 2(3)
045076  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
045102  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS THE PS 11?
045110  001403                          BEQ     .+10
045112  004767  013566                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 11
045116  000032                          32              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


045120  022700  177252                  CMP     #177252,%0      ;IS THE RESULT 177252?
045124  001403                          BEQ     .+10
045126                          1$:
045126  004767  013552                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177252 OR INCORRECT SEQUENCE
045132  000033                          33              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
045134  021527  000057                  CMP     (R5),#57                ;IS $TESTN = #57
045140  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
045142  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:60        ASH     125252 SHIFTED BY @(3) = 177525  PS - 10
                                ;*******************************************************************

045144  010767  133022          TST60:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045150  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
045154  072073  000000                  ASH     @(3),%0         ;SHIFT R0 BY @(3)
045160  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
045164  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
045172  001403                          BEQ     .+10
045174  004767  013504                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
045200  000034                          34              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045202  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
045206  001403                          BEQ     .+10
045210                          1$:
045210  004767  013470                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045214  000035                          35              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045216  021527  000060                  CMP     (R5),#60                ;IS $TESTN - #60
045222  001372                          BEQ     1$              ;IF NOT THEN GO TO HLT ABOVE
045224  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:61        ASH     125252 SHIFTED BY @(3)+   177525  PS   10
                                ;*******************************************************************

045226  010767  132740          TST61:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045232  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
045236  072033                          ASH     @(3)+,%0        ;SHIFT R0 BY @(3)+
045240  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
045244  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
045252  001403                          BEQ     .+10
045254  004767  013424                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
045260  000036                          36              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045262  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
045266  001403                          BEQ     .+10
045270                          1$:
045270  004767  013410                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045274  000037                          37              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
```

```
                                                        ;BY  (013746  000172  000207)

045276  021527  000061                  CMP     (R5),#61                ;IS $TESTN - #61
045302  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
045304  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:62        ASH     125252 SHIFTED BY @-(3) = 177525  PS    10
                                ;*****************************************************************

045306  010767  132660          TST62:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045312  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
045316  072053                          ASH     @-(3),%0        ;SHIFT R0 BY @-(3)
045320  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
045324  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
045332  001403                          BEQ     .+10
045334  004767  013344                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
045340  000040                          40              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045342  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
045346  001403                          BEQ     .+10
045350                          1$:
045350  004767  013330                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045354  000041                          41              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045356  021527  000062                  CMP     (R5),#62                ;IS $TESTN   #62
045362  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
045364  005215                          INC     (R5)
```

```
                                                        ;*******************************
                                                        ;     ASHC INSTRUCTION TESTS
                                                        ;*******************************



                                                                ;************
                                                                ;TESTS 63-157
                                                                ;************


045366  010767  132600                  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045372  012737  000062  042426          MOV     #62,@#COUNT
045400  005037  042432                  CLR     @#TEMP1         ;TEMP1=0
045404  012737  000001  042434          MOV     #1,@#TEMP2      ;TEMP2=1
045412  005037  042436                  CLR     @#TEMP3         ;TEMP3=0
045416  005037  042440                  CLR     @#TEMP4         ;TEMP4=0
045422  012737  000001  042442          MOV     #1,@#TEMP5      ;TEMP5=1
045430  005037  042444                  CLR     @#TEMP6         ;0 1 SHIFTED BY 0=0 1, PS=0

045434  010502                  REG01:  MOV     R5,R2           ;SAVE R5
045436  013700  042432                  MOV     @#TEMP1,%0      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 0
045442  013701  042434                  MOV     @#TEMP2,%0.1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 1
045446  000241                          CLC
045450  032737  000001  000306          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
045456  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
045460  013705  042436                  MOV     @#TEMP3,R5      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045464  073005                          ASHC    R5,R0           ;USING R0
045466  000402                          BR      4$
045470  073067  174742          2$:     ASHC    TEMP3,%0        ;ASHC REGISTER 0 BY THE CONTENTS OF TEMP3
045474  106737  042430          4$:     MFPS    @#PSWORD        ;SAVE PS
045500  123737  042444  042430          CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045506  001403                          BEQ     .+10
045510  004767  013170                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG PS
045514  000042                          42              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


045516  005237  042426                  INC     @#COUNT
045522  023700  042440                  CMP     @#TEMP4,%0      ;IS THE RESULT IN R0 SAME AS TEMP4?
045526  001403                          BEQ     .+10
045530  004767  013150                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG RESULT IN R0
045534  000043                          43              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


045536  023701  042442                  CMP     @#TEMP5,%1      ;IS THE RESULT IN R1 SAME AS TEMP5?
045542  001403                          BEQ     .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                                ;AND PS=TEMP6
045544  004767  013134                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG RESULT IN R1
045550  000044                          44              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


045552  010205                          MOV     R2,R5           ;RESTORE R5
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045554  021537  042426                  CMP     (R5),@#COUNT     ;IS TEST NUMBER=COUNTER?
045560  001403                          BEQ     .+10
045562  004767  013116                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;NO
045566  000045                          45              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045570  005215                          INC     (R5)
045572  021527  000160                  CMP     (R5),#160        ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045576  002014                          BGE     6$               ;YES
045600  005237  042436                  INC     @#TEMP3
045604  000241                          CLC
045606  006137  042442                  ROL     @#TEMP5          ;ROTATE TEMP5 LEFT BY 1 PLACE
045612  006137  042440                  ROL     @#TEMP4          ;INTRODUCE CARRY FROM TEMP4 IN TEMP5
045616  021527  000121                  CMP     (R5),#121        ;IS IT TEST 121?
045622  001004                          BNE     REGR23
045624  004467  000414                  JSR     R4,RITSH         ;IF SO THEN GO AND INITIATE RIGHT SHIFT
045630  004767  000444          6$:     JSR     %7,TST160
045634  010767  132332          REGR23: MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
045640  013702  042432                  MOV     @#TEMP1,%2       ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 2
045644  013703  042434                  MOV     @#TEMP2,%2!1     ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 3
045650  000241                          CLC
045652  032737  000001  000306          BIT     #1,@#$PASS       ;IS IT AN EVEN PASS ?
045660  001004                          BNE     2$               ;IF NOT THEN GO TO 2$
045662  013704  042436                  MOV     @#TEMP3,R4       ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045666  073204                          ASHC    R4,R2            ;USING R2
045670  000402                          BR      4$
045672  073267  174540          2$:     ASHC    TEMP3,%2         ;ASHC REGISTER 2 BY THE CONTETNS OF TEMP3
045676  106737  042430          4$:     MFPS    @#PSWORD         ;SAVE PS
045702  123737  042444  042430          CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045710  001403                          BEQ     .+10
045712  004767  012766                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;WRONG PS
045716  000046                          46              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045720  005237  042426                  INC     @#COUNT
045724  023702  042440                  CMP     @#TEMP4,%2       ;IS THE RESULT IN R2 SAME AS TEMP4?
045730  001403                          BEQ     .+10
045732  004767  012746                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;WRONG RESULT IN R2
045736  000047                          47              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045740  023703  042442                  CMP     @#TEMP5,%3       ;IS THE RESULT IN R3 SAME AS TEMP5?
045744  001403                          BEQ     .+10             ;TEMP1 TEMP2 SHIFTED BY TEMP3 TEMP4 TEMP5
                                                                 ;AND PS=TEMP6
045746  004767  012732                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;WRONG RESULT IN R1
045752  000050                          50              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045754  021537  042426                  CMP     (R5),@#COUNT     ;IS TEST NUMBER=COUNTER?
045760  001403                          BEQ     .+10
045762  004767  012716                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;NO
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045766  000051                          51              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045770  005215                          INC     (R5)
045772  021527  000160                  CMP     (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045776  002014                          BGE     6$              ;YES
046000  005237  042436                  INC     @#TEMP3
046004  000241                          CLC
046006  006137  042442                  ROL     @#TEMP5         ;ROTATE TEMP5 LEFT BY 1 PLACE
046012  006137  042440                  ROL     @#TEMP4         ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
046016  021527  000121                  CMP     (R5),#121       ;IS IT TEST 121?
046022  001004                          BNE     REG45
046024  004467  000214                  JSR     R4,RITSH        ;IF SO THEN GO AND INITIATE RIGHT SHIFT
046030  004767  000244          6$:     JSR     %7,TST160
046034  010767  132132          REG45:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
046040  010501                          MOV     R5,R1           ;SAVE R5
046042  013704  042432                  MOV     @#TEMP1,%4      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 4
046046  013705  042434                  MOV     @#TEMP2,%4!1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 5
046052  000241                          CLC
046054  032737  000001  000306          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
046062  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
046064  013700  042436                  MOV     @#TEMP3,R0      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
046070  073400                          ASHC    R0,R4           ;USING R4
046072  000402                          BR      4$
046074  073467  174336          2$:     ASHC    TEMP3,%4        ;ASHC REGISTER 4 BY THE CONTENTS OF TEMP3
046100  106737  042430          4$:     MFPS    @#PSWORD        ;SAVE PS
046104  123737  042444  042430          CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
046112  001403                          BEQ     .+10
046114  004767  012564                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG PS
046120  000052                          52              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

046122  005237  042426                  INC     @#COUNT
046126  023704  042440                  CMP     @#TEMP4,%4      ;IS THE RESULT IN R4 SAME AS TEMP4?
046132  001403                          BEQ     .+10
046134  004767  012544                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG RESULT IN R4
046140  000053                          53              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

046142  023705  042442                  CMP     @#TEMP5,%5      ;IS THE RESULT IN R5 SAME AS TEMP5?
046146  001403                          BEQ     .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3 TEMP4 TEMP5
                                                                ;AND PS=TEMP6
046150  004767  012530                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG RESULT IN R5
046154  000054                          54              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

046156  021137  042426                  CMP     (R1),@#COUNT    ;IS TEST NUMBER=COUNTER?
046162  001403                          BEQ     .+10
046164  004767  012514                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;NO
046170  000055                          55              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
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12412  046172  010105                          MOV     R1,R5           ;RESTORE R5
12413  046174  005215                          INC     (R5)
12414  046176  021527  000160                  CMP     (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
12415  046202  002014                          BGE     6$              ;YES
12416  046204  005237  042436                  INC     @#TEMP3
12417  046210  000241                          CLC
12418  046212  006137  042442                  ROL     @#TEMP5         ;ROTATE TEMP5 LEFT BY 1 PLACE
12419  046216  006137  042440                  ROL     @#TEMP4         ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
12420  046222  021527  000121                  CMP     (R5),#121       ;IS IT TEST 121?
12421  046226  001004                          BNE     8$
12422  046230  004467  000010                  JSR     R4,RITSH        ;IF SO THEN GO AND INITIATE RIGHT SHIFT
12423  046234  004767  000040          6$:     JSR     %7,TST160
12424  046240  000167  177170          8$:     JMP     REG01
12425  046244  022424                  RITSH:  CMP     (R4)+,(R4)+     ;MAKE R4 POINT TO THE NEXT REG TAG
12426  046246  012737  040000  042432          MOV     #40000,@#TEMP1  ;TEMP1=4000
12427  046254  005037  042434                  CLR     @#TEMP2         ;TEMP2=0
12428  046260  012737  177742  042436          MOV     #-30.,@#TEMP3   ;TEMP3=-30
12429  046266  005037  042440                  CLR     @#TEMP4         ;TEMP4=0
12430  046272  005237  042442                  INC     @#TEMP5         ;TEMP5=1
12431  046276  000204                          RTS     R4
12432  046300  021527  000160          TST160: CMP     (R5),#160       ;IS IT TEST 160
12433  046304  001010                          BNE     TST161          ;IF NOT THEN TRY TEST 161
12434  046306  005037  042432                  CLR     @#TEMP1         ;0 0 SHIFTED BY 0
12435  046312  005037  042440                  CLR     @#TEMP4         ;IS EQUAL TO 0 0
12436  046316  012737  000004  042444          MOV     #4,@#TEMP6      ;AND PS=4
12437  046324  000207                          RTS     %7
12438  046326  021527  000161          TST161: CMP     (R5),#161       ;IS IT TEST 161
12439  046332  001004                          BNE     TST162
12440  046334  012737  177746  042436          MOV     #-32,@#TEMP3    ;0 0 SHIFTED BY -32=0 0, PS=4
12441  046342  000207                          RTS     %7
12442  046344  021527  000162          TST162: CMP     (R5),#162       ;IS IT TEST 162
12443  046350  001004                          BNE     TST163          ;IF NOT THEN TRY TEST 163
12444  046352  012737  000032  042436          MOV     #32,@#TEMP3     ;0 0 SHIFTED BY 32=0 0, PS=4
12445  046360  000207                          RTS     %7
12446  046362  021527  000163          TST163: CMP     (R5),#163       ;IS IT TEST 163?
12447  046366  001016                          BNE     TST164          ;IF NOT THEN TRY TEST 164
12448  046370  012737  052525  042432          MOV     #52525,@#TEMP1  ;52525 0
12449  046376  012737  177760  042436          MOV     #-16.,@#TEMP3   ;SHIFTED BY -16.
12450  046404  005037  042440                  CLR     @#TEMP4
12451  046410  012737  052525  042442          MOV     #52525,@#TEMP5  ;IS EQUAL TO 0 52525
12452  046416  005037  042444                  CLR     @#TEMP6         ;AND PS = 0
12453  046422  000207                          RTS     %7
12454  046424  021527  000164          TST164: CMP     (R5),#164       ;IS IT TEST 164?
12455  046430  001014                          BNE     TST165          ;IF NOT THEN TRY TEST 165
12456  046432  012737  125252  042432          MOV     #125252,@#TEMP1 ;125252 0 SHIFTED BY -16.
12457  046440  005337  042440                  DEC     @#TEMP4
12458  046444  012737  125252  042442          MOV     #125252,@#TEMP5 ;IS EQUAL TO -1 125252
12459  046452  012737  000010  042444          MOV     #10,@#TEMP6     ;AND PS=10
12460  046460  000207                          RTS     %7
12461  046462  021527  000165          TST165: CMP     (R5),#165       ;IS IT TEST 165?
12462  046466  001007                          BNE     TST166          ;IF NOT THEN TRY TEST 166
12463  046470  012737  177777  042432          MOV     #-1,@#TEMP1     ;-1 0 SHIFTED BY -16
12464  046476  012737  177777  042442          MOV     #-1,@#TEMP5     ;IS EQUAL TO -1 -1, AND PS=10
12465  046504  000207                          RTS     %7
12466  046506  021527  000166          TST166: CMP     (R5),#166       ;IS IT TEST 166?
12467  046512  001011                          BNE     TST167          ;IF NOT THEN TRY TEST 167
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046514  012737  100000  042432          MOV     #100000,@#TEMP1 ;100000 0
046522  012737  177740  042436          MOV     #-32.,@#TEMP3   ;SHIFTED BY -32 IS EQUAL TO -1 -1
046530  005237  042444                  INC     @#TEMP6         ;AND PS=11
046534  000207                          RTS     %7
046536  021527  000167          TST167: CMP     (R5),#167       ;IS IT TEST 167?
046542  001014                          BNE     TST170          ;IF NOT THEN TRY TEST 170
046544  005037  042432                  CLR     @#TEMP1
046550  005337  042434                  DEC     @#TEMP2         ;0 -1
046554  012737  000020  042436          MOV     #16.,@#TEMP3    ;SHIFTED BY 16.
046562  005037  042442                  CLR     @#TEMP5         ;IS EQUAL TO -1 0
046566  005237  042444                  INC     @#TEMP6         ;AND PS=12
046572  000207                          RTS     %7
046574  021527  000170          TST170: CMP     (R5),#170       ;IS IT TEST 170?
046600  001007                          BNE     TST171          ;IF NOT THEN TRY TEST 171
046602  012737  125252  042434          MOV     #125252,@#TEMP2 ;0 125252 SHIFTED BY 16
046610  012737  125252  042440          MOV     #125252,@#TEMP4 ;IS EQUAL TO 125252 0, AND PS=12
046616  000207                          RTS     %7
046620  021527  000171          TST171: CMP     (R5),#171       ;IS IT TEST 171?
046624  001010                          BNE     TST172          ;IF NOT THEN TRY TEST 172
046626  005337  042436                  DEC     @#TEMP3         ;0 125252 SHIFTED BY 15
046632  012737  052525  042440          MOV     #52525,@#TEMP4  ;IS EQUAL TO 52525 0
046640  005037  042444                  CLR     @#TEMP6         ;AND PS=0
046644  000207                          RTS     %7
046646  021527  000172          TST172: CMP     (R5),#172       ;IS IT TEST 172?
046652  001006                          BNE     TST173          ;IF NOT THEN TRY TEST 173
046654  012737  052525  042434          MOV     #52525,@#TEMP2  ;0 52525
046662  005237  042436                  INC     @#TEMP3         ;SHIFTED BY 16. IS EQUAL TO 52525 0, AND PS 0
046666  000207                          RTS     %7
046670  021527  000173          TST173: CMP     (R5),#173       ;IS IT TEST 173?
046674  001014                          BNE     TST174          ;IF NOT THEN TRY TEST 174
046676  012737  177777  042434          MOV     #-1,@#TEMP2     ;0 -1
046704  005337  042436                  DEC     @#TEMP3         ;SHIFTED BY 15.
046710  012737  077777  042440          MOV     #77777,@#TEMP4
046716  012737  100000  042442          MOV     #100000,@#TEMP5 ;IS EQUAL TO 77777 100000, AND PS=0
046724  000207                          RTS     %7
046726  021527  000174          TST174: CMP     (R5),#174       ;IS IT TEST 174?
046732  001013                          BNE     TST175          ;IF NOT THEN TRY TEST 175
046734  012737  100000  042432          MOV     #100000,@#TEMP1
046742  005337  042434                  DEC     @#TEMP2         ;100000 -2 SHIFTED BY 15.
046746  005037  042442                  CLR     @#TEMP5         ;IS EQUAL TO 77777 0
046752  012737  000002  042444          MOV     #2,@#TEMP6      ;AND PS=2
046760  000207                          RTS     %7
046762  021527  000175          TST175: CMP     (R5),#175       ;IS IT TEST 175?
046766  001015                          BNE     ENT176          ;IF NOT THEN TRY TEST 176
046770  012737  177777  042432          MOV     #-1,@#TEMP1
046776  005037  042434                  CLR     @#TEMP2         ;-1 0
047002  005237  042436                  INC     @#TEMP3         ;SHIFTED BY 16.
047006  005037  042440                  CLR     @#TEMP4         ;IS EQUAL TO 0 0
047012  012737  000007  042444          MOV     #7,@#TEMP6      ;AND PS=7
047020  000207                          RTS     %7
047022  021527  000176          ENT176: CMP     (R5),#176       ;IS THE PROGRM ENTERING TEST 176?
047026  001403                          BEQ     .+10
047030  004767  011650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST NUMBER GOOFED
047034  000056                          56              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
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047036  005726                          TST     (SP)+           ;RESTORE STACK POINTER

                                ;*****************************************************************
                                ;TEST:176       1 SHIFTED BY 8. = 400  PS = 0
                                ;*****************************************************************

047040  010767  131126          TST176: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047044  012701  000000                  MOV     #DUMMY,%1       ;LOAD R1 WITH DUMMY
047050  012701  000001                  MOV     #1,%1!1         ;LOAD R1!1 WITH 1
047054  000241                          CLC
047056  073127  000010                  ASHC    #8.,%1          ;SHIFT R1,R1.1 BY 8.
047062  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
047066  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS THE PS 0?
047074  001403                          BEQ     .+10
047076  004767  011602                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
047102  000057                          57              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047104  022701  000400                  CMP     #400,%1         ;IS THE RESULT 400?
047110  001403                          BEQ     .+10
047112  004767  011566                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R1 IS NOT EQUAL TO 400
047116  000060                          60              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047120  021527  000176                  CMP     (R5),#176               ;IS $TESTN = #176?
047124  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047126  004767  011552                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
047132  000061                          61              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047134  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:177       -1 SHIFTED BY 15. = 100000  PS = 11
                                ;*****************************************************************

047136  010767  131030          TST177: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047142  012703  000000                  MOV     #DUMMY,%3       ;LOAD R3 WITH DUMMY
047146  012703  177777                  MOV     #-1,%3!1        ;LOAD R3!1 WITH -1
047152  000241                          CLC
047154  073327  000017                  ASHC    #15.,%3         ;SHIFT R3,R3!1 BY 15.
047160  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
047164  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS THE PS 11?
047172  001403                          BEQ     .+10
047174  004767  011504                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 11
047200  000062                          62              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047202  022703  100000                  CMP     #100000,%3      ;IS THE RESULT 100000?
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047206  001403                          BEQ     .+10
047210  004767  011470                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R3 IS NOT EQUAL TO 100000
047214  000063                          63              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047216  021527  000177                  CMP     (R5),#177               ;IS $TESTN = #177?
047222  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047224  004767  011454                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047230  000064                          64              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047232  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:200       52525 SHIFTED BY 0 = 52525  PS = 0
                                ;*******************************************************************

047234  010767  130732          TST200: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047240  010501                          MOV     R5,R1           ;SAVE R5
047242  012705  000000                  MOV     #DUMMY,%5       ;LOAD R5 WITH DUMMY
047246  012705  052525                  MOV     #52525,%5.1     ;LOAD R5!1 WITH 52525
047252  000241                          CLC
047254  073527  000000                  ASHC    #0,%5           ;SHIFT R5,R5!1 BY 0
047260  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
047264  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS THE PS 0?
047272  001403                          BEQ     .+10
047274  004767  011404                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 0
047300  000065                          65              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047302  022705  052525                  CMP     #52525,%5       ;IS THE RESULT 52525?
047306  001403                          BEQ     .+10
047310  004767  011370                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R5 IS NOT EQUAL TO 52525
047314  000066                          66              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047316  010105                          MOV     R1,R5           ;RESTORE R5
047320  021527  000200                  CMP     (R5),#200               ;IS $TESTN = #200?
047324  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047326  004767  011352                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047332  000067                          67              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047334  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:201       20010 SHIFTED BY -13. = 101  PS = 0
                                ;*******************************************************************
```

```
047336  010767  130630          TST201: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
047342  012701  000000                  MOV     #DUMMY,%1         ;LOAD R1 WITH DUMMY
047346  012701  020010                  MOV     #20010,%1.1       ;LOAD R1!1 WITH 20010
047352  000241                          CLC
047354  073127  177763                  ASHC    #-13.,%1          ;SHIFT R1,R1!1 BY -13.
047360  106737  042430                  MFPS    @#PSWORD          ;SAVE PS
047364  122737  000000  042430          CMPB    #0,@#PSWORD       ;IS THE PS 0?
047372  001403                          BEQ     .+10
047374  004767  011304                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;THE PS IS NOT EQUAL TO 0
047400  000070                          70              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047402  022701  000101                  CMP     #101,%1           ;IS THE RESULT 101?
047406  001403                          BEQ     .+10
047410  004767  011270                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;R1 IS NOT EQUAL TO 101
047414  000071                          71              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047416  021527  000201                  CMP     (R5),#201                 ;IS $TESTN = #201?
047422  001403                          BEQ     .+10              ;IF NOT THEN GO TO HLT
047424  004767  011254                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;TEST IS IN WRONG SEQUENCE
047430  000072                          72              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047432  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:202       -1 SHIFTED BY 16. = 0  PS = 11
                                ;*******************************************************************

047434  010767  130532          TST202: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
047440  012703  000000                  MOV     #DUMMY,%3         ;LOAD R3 WITH DUMMY
047444  012703  177777                  MOV     #-1,%3!1          ;LOAD R3!1 WITH -1
047450  000241                          CLC
047452  073327  000020                  ASHC    #16.,%3           ;SHIFT R3,R3!1 BY 16.
047456  106737  042430                  MFPS    @#PSWORD          ;SAVE PS
047462  122737  000011  042430          CMPB    #11,@#PSWORD      ;IS THE PS 11?
047470  001403                          BEQ     .+10
047472  004767  011206                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;THE PS IS NOT EQUAL TO 11
047476  000073                          73              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047500  022703  000000                  CMP     #0,%3             ;IS THE RESULT 0?
047504  001403                          BEQ     .+10
047506  004767  011172                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;R3 IS NOT EQUAL TO 0
047512  000074                          74              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047514  021527  000202                  CMP     (R5),#202                 ;IS $TESTN = #202?
047520  001403                          BEQ     .+10              ;IF NOT THEN GO TO HLT
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047522  004767  011156                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047526  000075                          75              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047530  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:203       1 SHIFTED BY -1   100000  PS - 1
                                ;*******************************************************************

047532  010767  130434          TST203: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047536  010501                          MOV     R5,R1           ;SAVE R5
047540  012705  000000                  MOV     #DUMMY,%5       ;LOAD R5 WITH DUMMY
047544  012705  000001                  MOV     #1,%5.1         ;LOAD R5.1 WITH 1
047550  000241                          CLC
047552  073527  177777                  ASHC    #-1,%5          ;SHIFT R5,R5.1 BY -1
047556  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
047562  122737  000001  042430          CMPB    #1,@#PSWORD     ;IS THE PS 1?
047570  001403                          BEQ     .+10
047572  004767  011106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 1
047576  000076                          76              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047600  022705  100000                  CMP     #100000,%5      ;IS THE RESULT 100000?
047604  001403                          BEQ     .+10
047606  004767  011072                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R5 IS NOT EQUAL TO 100000
047612  000077                          77              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047614  010105                          MOV     R1,R5           ;RESTORE R5
047616  021527  000203                  CMP     (R5),#203               ;IS $TESTN - #203?
047622  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047624  004767  011054                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047630  000100                          100             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047632  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:204       125252 SHIFTED BY -16. = 125252  PS - 11
                                ;*******************************************************************

047634  010767  130332          TST204: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047640  012701  000000                  MOV     #DUMMY,%1       ;LOAD R1 WITH DUMMY
047644  012701  125252                  MOV     #125252,%1!1    ;LOAD R1!1 WITH 125252
047650  000241                          CLC
047652  073127  177760                  ASHC    #-16.,%1        ;SHIFT R1,R1!1 BY -16.
047656  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
047662  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS THE PS 11?
047670  001403                          BEQ     .+10
```

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047672  004767  011006                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;THE PS IS NOT EQUAL TO 11
047676  000101                          101             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047700  022701  125252                  CMP     #125252,%1      ;IS THE RESULT 125252?
047704  001403                          BEQ     .+10
047706  004767  010772                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;R1 IS NOT EQUAL TO 125252
047712  000102                          102             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047714  021527  000204                  CMP     (R5),#204               ;IS $TESTN = #204?
047720  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047722  004767  010756                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;TEST IS IN WRONG SEQUENCE
047726  000103                          103             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047730  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:205       125252 125252 SHIFTED BY 21. = 52500 000000  PS   3
                                ;*******************************************************************

047732  010767  130234          TST205: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047736  012702  125252                  MOV     #125252,%2      ;LOAD R2 WITH 125252
047742  012703  125252                  MOV     #125252,%2!1    ;LOAD R2!1 WITH 125252
047746  000241                          CLC
047750  073227  000025                  ASHC    #21.,%2         ;SHIFT R2,R2!1 BY 21.
047754  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
047760  122737  000003  042430          CMPB    #3,@#PSWORD     ;IS THE PS 3?
047766  001403                          BEQ     .+10
047770  004767  010710                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;THE PS IS NOT EQUAL TO 3
047774  000104                          104             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047776  022702  052500                  CMP     #52500,%2       ;IS THE RESULT 52500?
050002  001403                          BEQ     .+10
050004  004767  010674                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;R2 IS NOT EQUAL TO 52500
050010  000105                          105             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050012  022703  000000                  CMP     #000000,%2!1    ;IS THE RESULT 000000?
050016  001403                          BEQ     .+10
050020  004767  010660                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;R2!1 IS NOT EQUAL TO 000000
050024  000106                          106             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050026  021527  000205                  CMP     (R5),#205               ;IS $TESTN = #205?
050032  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
050034  004767  010644                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

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                                                                    ;TEST IS IN WRONG SEQUENCE
050040  000107                          107                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

050042  005215                          INC     (R5)


050044  012702  177771                  MOV     #-7,%2
050050  012703  042452                  MOV     #S1,%3
050054  012704  042454                  MOV     #S2,%4

                                ;*******************************************************************
                                ;TEST:206       125252 125252 SHIFTED BY S1 - 177525 52525  PS - 10
                                ;*******************************************************************

050060  010767  130106          TST206: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
050064  012700  125252                  MOV     #125252,%0                  ;LOAD R0 WITH 125252
050070  012701  125252                  MOV     #125252,%0!1        ;LOAD R0!1 WITH 125252
050074  000241                          CLC
050076  073067  172350                  ASHC    S1,%0               ;SHIFT R0,R0!1 BY S1
050102  106737  042430                  MFPS    @#PSWORD            ;SAVE PS
050106  122737  000010  042430          CMPB    #10,@#PSWORD        ;IS THE PS 10?
050114  001403                          BEQ     .+10
050116  004767  010562                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;THE PS IS NOT EQUAL TO 10
050122  000110                          110                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)


050124  022700  177525                  CMP     #177525,%0          ;IS THE RESULT 177525?
050130  001403                          BEQ     .+10
050132  004767  010546                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;R0 IS NOT EQUAL TO 177525
050136  000111                          111                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

050140  022701  052525                  CMP     #52525,%0!1         ;IS THE RESULT 52525?
050144  001403                          BEQ     .+10
050146                          1$:
050146  004767  010532                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050152  000112                          112                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

050154  021527  000206                  CMP     (R5),#206                   ;IS THE $TESTN - #206?
050160  001372                          BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
050162  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:207       125252 125252 SHIFTED BY @S2 = 177525 52525  PS - 10
                                ;*******************************************************************

050164  010767  130002          TST207: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
050170  012700  125252                  MOV     #125252,%0                  ;LOAD R0 WITH 125252
050174  012701  125252                  MOV     #125252,%0!1        ;LOAD R0!1 WITH 125252
```

```
050200  000241                          CLC
050202  073077  172246                  ASHC    @S2,%0          ;SHIFT R0,R0.1 BY @S2
050206  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
050212  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050220  001403                          BEQ     .+10
050222  004767  010456                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
050226  000113                          113             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050230  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050234  001403                          BEQ     .+10
050236  004767  010442                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050242  000114                          114             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050244  022701  052525                  CMP     #52525,%0.1     ;IS THE RESULT 52525?
050250  001403                          BEQ     .+10
050252                          1$:
050252  004767  010426                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050256  000115                          115             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050260  021527  000207                  CMP     (R5),#207               ;IS THE $TESTN = #207?
050264  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050266  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:210       125252 125252 SHIFTED BY @#S1 = 177525 52525  PS    10
                                ;*******************************************************************

050270  010767  127676          TST210: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050274  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050300  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050304  000241                          CLC
050306  073037  042452                  ASHC    @#S1,%0         ;SHIFT R0,R0!1 BY @#S1
050312  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
050316  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050324  001403                          BEQ     .+10
050326  004767  010352                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
050332  000116                          116             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050334  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050340  001403                          BEQ     .+10
050342  004767  010336                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050346  000117                          117             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050350  022701  052525                  CMP     #52525,%0.1     ;IS THE RESULT 52525?
050354  001403                          BEQ     .+10
```

```
050356                          1$:
050356  004767  010322                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                         ;R0.1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050362  000120                          120             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050364  021527  000210                  CMP     (R5),#210               ;IS THE $TESTN - #210?
050370  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050372  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:211       125252 125252 SHIFTED BY (3) = 177525 52525  PS = 10
                                ;*******************************************************************

050374  010767  127572          TST211: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050400  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050404  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050410  000241                          CLC
050412  073013                          ASHC    (3),%0          ;SHIFT R0,R0!1 BY (3)
050414  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
050420  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050426  001403                          BEQ     .+10
050430  004767  010250                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                         ;THE PS IS NOT EQUAL TO 10
050434  000121                          121             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050436  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050442  001403                          BEQ     .+10
050444  004767  010234                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                         ;R0 IS NOT EQUAL TO 177525
050450  000122                          122             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050452  022701  052525                  CMP     #52525,%0.1     ;IS THE RESULT 52525?
050456  001403                          BEQ     .+10
050460                          1$:
050460  004767  010220                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                         ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050464  000123                          123             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050466  021527  000211                  CMP     (R5),#211               ;IS THE $TESTN  #211?
050472  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050474  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:212       125252 125252 SHIFTED BY (3)+ - 177525 52525  PS  10
                                ;*******************************************************************

050476  010767  127470          TST212: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050502  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050506  012701  125252                  MOV     #125252,%0.1    ;LOAD R0.1 WITH 125252
050512  000241                          CLC
```

```
050514  073023                          ASHC    (3)+,%0         ;SHIFT R0,R0 1 BY (3)+
050516  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
050522  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050530  001403                          BEQ     .+10
050532  004767  010146                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
050536  000124                          124             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050540  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050544  001403                          BEQ     .+10
050546  004767  010132                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050552  000125                          125             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050554  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
050560  001403                          BEQ     .+10
050562                          1$:
050562  004767  010116                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050566  000126                          126             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050570  021527  000212                  CMP     (R5),#212               ;IS THE $TESTN - #212?
050574  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050576  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:213       125252 125252 SHIFTED BY -(3) = 177525 52525  PS   10
                                ;*******************************************************************

050600  010767  127366          TST213: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050604  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050610  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050614  000241                          CLC
050616  073043                          ASHC    -(3),%0         ;SHIFT R0,R0!1 BY -(3)
050620  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
050624  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050632  001403                          BEQ     .+10
050634  004767  010044                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
050640  000127                          127             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050642  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050646  001403                          BEQ     .+10
050650  004767  010030                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050654  000130                          130             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050656  022701  052525                  CMP     #52525,%0.1     ;IS THE RESULT 52525?
050662  001403                          BEQ     .+10
050664                          1$:
```

```
050664  004767  010014                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050670  000131                          131             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050672  021527  000213                  CMP     (R5),#213               ;IS THE $TESTN  #213?
050676  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050700  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:214       125252 125252 SHIFTED BY 2(4) - 177252 125252  PS   11
                                ;*******************************************************************

050702  010767  127264          TST214: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050706  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050712  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050716  000241                          CLC
050720  073064  000002                  ASHC    2(4),%0         ;SHIFT R0,R0!1 BY 2(4)
050724  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
050730  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS THE PS 11?
050736  001403                          BEQ     .+10
050740  004767  007740                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 11
050744  000132                          132             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050746  022700  177252                  CMP     #177252,%0      ;IS THE RESULT 177252?
050752  001403                          BEQ     .+10
050754  004767  007724                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177252
050760  000133                          133             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050762  022701  125252                  CMP     #125252,%0!1    ;IS THE RESULT 125252?
050766  001403                          BEQ     .+10
050770                          1$:
050770  004767  007710                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 125252 OR INCORRECT SEQUENCE
050774  000134                          134             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050776  021527  000214                  CMP     (R5),#214               ;IS THE $TESTN - #214?
051002  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
051004  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:215       125252 125252 SHIFTED BY @(4) = 177525 52525  PS   10
                                ;*******************************************************************

051006  010767  127160          TST215: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051012  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
051016  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
051022  000241                          CLC
051024  073074  000000                  ASHC    @(4),%0         ;SHIFT R0,R0!1 BY @(4)
```

```
051030  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051034  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
051042  001403                          BEQ     .+10
051044  004767  007634                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
051050  000135                          135             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051052  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
051056  001403                          BEQ     .+10
051060  004767  007620                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
051064  000136                          136             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051066  022701  052525                  CMP     #52525,%0.1     ;IS THE RESULT 52525?
051072  001403                          BEQ     .+10
051074                          1$:
051074  004767  007604                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051100  000137                          137             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051102  021527  000215                  CMP     (R5),#215               ;IS THE $TESTN - #215?
051106  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
051110  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:216       125252 125252 SHIFTED BY @(4)+ = 177525 52525  PS - 10
                                ;*******************************************************************

051112  010767  127054          TST216: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051116  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
051122  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
051126  000241                          CLC
051130  073034                          ASHC    @(4)+,%0                ;SHIFT R0,R0!1 BY @(4)+
051132  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051136  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS THE PS 10?
051144  001403                          BEQ     .+10
051146  004767  007532                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
051152  000140                          140             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051154  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
051160  001403                          BEQ     .+10
051162  004767  007516                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
051166  000141                          141             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051170  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
051174  001403                          BEQ     .+10
051176                          1$:
051176  004767  007502                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
                                                                    ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051202  000142                          142                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

051204  021527  000216                  CMP     (R5),#216                   ;IS THE $TESTN = #216?
051210  001372                          BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
051212  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:217       125252 125252 SHIFTED BY @-(4) = 177525 52525  PS = 10
                                ;*****************************************************************

051214  010767  126752          TST217: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
051220  012700  125252                  MOV     #125252,%0                  ;LOAD R0 WITH 125252
051224  012701  125252                  MOV     #125252,%0.1        ;LOAD R0!1 WITH 125252
051230  000241                          CLC
051232  073054                          ASHC    @-(4),%0                    ;SHIFT R0,R0!1 BY @-(4)
051234  106737  042430                  MFPS    @#PSWORD            ;SAVE PS
051240  122737  000010  042430          CMPB    #10,@#PSWORD        ;IS THE PS 10?
051246  001403                          BEQ     .+10
051250  004767  007430                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;THE PS IS NOT EQUAL TO 10
051254  000143                          143                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)


051256  022700  177525                  CMP     #177525,%0          ;IS THE RESULT 177525?
051262  001403                          BEQ     .+10
051264  004767  007414                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;R0 IS NOT EQUAL TO 177525
051270  000144                          144                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)


051272  022701  052525                  CMP     #52525,%0!1         ;IS THE RESULT 52525?
051276  001403                          BEQ     .+10
051300                          1$:
051300  004767  007400                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051304  000145                          145                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)


051306  021527  000217                  CMP     (R5),#217                   ;IS THE $TESTN = #217?
051312  001372                          BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
051314  005215                          INC     (R5)
```

```
                                                        ;*******************************
                                                        ;     MUL INSTRUCTION TESTS
                                                        ;*******************************


                                        ;*****************************************************************
                                        ;TEST:220       MUL      1 * #0 = 0 0        PS = 4
                                        ;*****************************************************************

051316  010767  126650          TST220: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051322  012700  000001                  MOV     #1,%0           ;LOAD MULTIPLICAND WITH 1
051326  070027  000000                  MUL     #0,%0           ;MULTIPLY 1 * #0
051332  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051336  122737  000004  042430          CMPB    #4,@#PSWORD     ;IS PS = 4
051344  001403                          BEQ     .+10
051346  004767  007332                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
051352  000146                          146             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051354  022700  000000                  CMP     #0,%0           ;IS HIGH ORDER = 0
051360  001403                          BEQ     .+10
051362  004767  007316                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
051366  000147                          147             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051370  022701  000000                  CMP     #0,%0!1         ;IS LOW ORDER = 0
051374  001403                          BEQ     .+10
051376                          1$:
051376  004767  007302                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051402  000150                          150             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051404  021527  000220                  CMP     (R5),#220
051410  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051412  005215                          INC     (R5)


                                        ;*****************************************************************
                                        ;TEST:221       MUL      -1 * #1 = -1 -1        PS   10
                                        ;*****************************************************************

051414  010767  126552          TST221: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051420  012700  177777                  MOV     #-1,%0          ;LOAD MULTIPLICAND WITH -1
051424  070027  000001                  MUL     #1,%0           ;MULTIPLY -1 * #1
051430  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051434  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS PS = 10
051442  001403                          BEQ     .+10
051444  004767  007234                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
051450  000151                          151             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
051452  022700  177777                  CMP     #-1,%0          ;IS HIGH ORDER = -1
051456  001403                          BEQ     .+10
051460  004767  007220                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
051464  000152                          152             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051466  022701  177777                  CMP     #-1,%0!1        ;IS LOW ORDER = -1
051472  001403                          BEQ     .+10
051474                          1$:
051474  004767  007204                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051500  000153                          153             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051502  021527  000221                  CMP     (R5),#221
051506  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051510  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:222       MUL     2 * #2 = 0 4        PS   0
                                ;*****************************************************************

051512  010767  126454          TST222: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051516  012702  000002                  MOV     #2,%2           ;LOAD MULTIPLICAND WITH 2
051522  070227  000002                  MUL     #2,%2           ;MULTIPLY 2 * #2
051526  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051532  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
051540  001403                          BEQ     .+10
051542  004767  007136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
051546  000154                          154             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051550  022702  000000                  CMP     #0,%2           ;IS HIGH ORDER = 0
051554  001403                          BEQ     .+10
051556  004767  007122                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
051562  000155                          155             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051564  022703  000004                  CMP     #4,%2!1         ;IS LOW ORDER = 4
051570  001403                          BEQ     .+10
051572                          1$:
051572  004767  007106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051576  000156                          156             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051600  021527  000222                  CMP     (R5),#222
051604  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051606  005215                          INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:223       MUL     1000 * #200 - 1 0       PS   1
                                        ;*******************************************************************

051610  010767  126356          TST223: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051614  010501                          MOV     R5,R1           ;SAVE R5
051616  012704  001000                  MOV     #1000,%4        ;LOAD MULTIPLICAND WITH 1000
051622  070427  000200                  MUL     #200,%4         ;MULTIPLY 1000 * #200
051626  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051632  122737  000001  042430          CMPB    #1,@#PSWORD     ;IS PS = 1
051640  001403                          BEQ     .+10
051642  004767  007036                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
051646  000157                          157             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051650  022704  000001                  CMP     #1,%4           ;IS HIGH ORDER - 1
051654  001403                          BEQ     .+10
051656  004767  007022                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
051662  000160                          160             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051664  022705  000000                  CMP     #0,%4!1         ;IS LOW ORDER = 0
051670  001403                          BEQ     .+10
051672                          1$:
051672  004767  007006                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051676  000161                          161             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051700  021127  000223                  CMP     (R1),#223               ;CHECK THE TEST NUMBER
051704  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051706  010105                          MOV     R1,R5           ;RESTORE R5
051710  005215                          INC     (R5)


                                        ;*******************************************************************
                                        ;TEST:224       MUL     2 * #77777 - 0 177776       PS = 1
                                        ;*******************************************************************

051712  010767  126254          TST224: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051716  012700  000002                  MOV     #2,%0           ;LOAD MULTIPLICAND WITH 2
051722  070027  077777                  MUL     #77777,%0       ;MULTIPLY 2 * #77777
051726  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
051732  122737  000001  042430          CMPB    #1,@#PSWORD     ;IS PS = 1
051740  001403                          BEQ     .+10
051742  004767  006736                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
051746  000162                          162             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051750  022700  000000                  CMP     #0,%0           ;IS HIGH ORDER = 0
051754  001403                          BEQ     .+10
051756  004767  006722                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
```

```
051762  000163                          163             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051764  022701  177776                  CMP     #177776,%0!1    ;IS LOW ORDER = 177776
051770  001403                          BEQ     .+10
051772                          1$:
051772  004767  006706                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051776  000164                          164             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052000  021527  000224                  CMP     (R5),#224
052004  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052006  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:225       MUL     7777 * #10 = 0 77770        PS   0
                                ;*******************************************************************

052010  010767  126156          TST225: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052014  012702  007777                  MOV     #7777,%2        ;LOAD MULTIPLICAND WITH 7777
052020  070227  000010                  MUL     #10,%2          ;MULTIPLY 7777 * #10
052024  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
052030  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
052036  001403                          BEQ     .+10
052040  004767  006640                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
052044  000165                          165             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052046  022702  000000                  CMP     #0,%2           ;IS HIGH ORDER = 0
052052  001403                          BEQ     .+10
052054  004767  006624                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
052060  000166                          166             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052062  022703  077770                  CMP     #77770,%2!1     ;IS LOW ORDER = 77770
052066  001403                          BEQ     .+10
052070                          1$:
052070  004767  006610                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052074  000167                          167             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052076  021527  000225                  CMP     (R5),#225
052102  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052104  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:226       MUL     77777 * #77777 = 37777 1        PS = 1
                                ;*******************************************************************

052106  010767  126060          TST226: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
```

```
052112  010501                          MOV     R5,R1           ;SAVE R5
052114  012704  077777                  MOV     #77777,%4       ;LOAD MULTIPLICAND WITH 77777
052120  070427  077777                  MUL     #77777,%4       ;MULTIPLY 77777 * #77777
052124  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
052130  122737  000001  042430          CMPB    #1,@#PSWORD     ;IS PS = 1
052136  001403                          BEQ     .+10
052140  004767  006540                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
052144  000170                          170             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052146  022704  037777                  CMP     #37777,%4       ;IS HIGH ORDER = 37777
052152  001403                          BEQ     .+10
052154  004767  006524                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
052160  000171                          171             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052162  022705  000001                  CMP     #1,%4.1         ;IS LOW ORDER = 1
052166  001403                          BEQ     .+10
052170                          1$:
052170  004767  006510                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052174  000172                          172             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052176  021127  000226                  CMP     (R1),#226               ;CHECK THE TEST NUMBER
052202  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052204  010105                          MOV     R1,R5           ;RESTORE R5
052206  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:227       MUL     -1 * #77777 - -1 100001         PS   10
                                ;*******************************************************************

052210  010767  125756          TST227: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052214  012702  177777                  MOV     #-1,%2          ;LOAD MULTIPLICAND WITH -1
052220  070227  077777                  MUL     #77777,%2       ;MULTIPLY -1 * #77777
052224  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
052230  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS PS = 10
052236  001403                          BEQ     .+10
052240  004767  006440                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
052244  000173                          173             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052246  022702  177777                  CMP     #-1,%2          ;IS HIGH ORDER = -1
052252  001403                          BEQ     .+10
052254  004767  006424                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
052260  000174                          174             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052262  022703  100001                  CMP     #100001,%2.1    ;IS LOW ORDER = 100001
052266  001403                          BEQ     .+10
```

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052270                          1$:
052270  004767  006410                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052274  000175                          175             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052276  021527  000227                  CMP     (R5),#227
052302  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052304  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:230       MUL     -2 * #77777 = -1 2      PS - 11
                                ;*******************************************************************

052306  010767  125660          TST230: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052312  012700  177776                  MOV     #-2,%0          ;LOAD MULTIPLICAND WITH -2
052316  070027  077777                  MUL     #77777,%0       ;MULTIPLY -2 * #77777
052322  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
052326  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
052334  001403                          BEQ     .+10
052336  004767  006342                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052342  000176                          176             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052344  022700  177777                  CMP     #-1,%0          ;IS HIGH ORDER - -1
052350  001403                          BEQ     .+10
052352  004767  006326                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052356  000177                          177             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052360  022701  000002                  CMP     #2,%0!1         ;IS LOW ORDER = 2
052364  001403                          BEQ     .+10
052366                          1$:
052366  004767  006312                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052372  000200                          200             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052374  021527  000230                  CMP     (R5),#230
052400  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052402  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:231       MUL     125252 * #2 = -1 52524          PS = 11
                                ;*******************************************************************

052404  010767  125562          TST231: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052410  012702  125252                  MOV     #125252,%2      ;LOAD MULTIPLICAND WITH 125252
052414  070227  000002                  MUL     #2,%2           ;MULTIPLY 125252 * #2
052420  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
052424  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
052432  001403                          BEQ     .+10
```

```
052434  004767  006244                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052440  000201                          201             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052442  022702  177777                  CMP     #-1,%2          ;IS HIGH ORDER = -1
052446  001403                          BEQ     .+10
052450  004767  006230                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052454  000202                          202             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052456  022703  052524                  CMP     #52524,%2.1     ;IS LOW ORDER = 52524
052462  001403                          BEQ     .+10
052464                          1$:
052464  004767  006214                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052470  000203                          203             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052472  021527  000231                  CMP     (R5),#231
052476  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052500  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:232       MUL     125252 * #40000   165252 100000        PS   11
                                ;*******************************************************************

052502  010767  125464          TST232: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052506  010501                          MOV     R5,R1           ;SAVE R5
052510  012704  125252                  MOV     #125252,%4      ;LOAD MULTIPLICAND WITH 125252
052514  070427  040000                  MUL     #40000,%4       ;MULTIPLY 125252 * #40000
052520  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
052524  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
052532  001403                          BEQ     .+10
052534  004767  006144                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052540  000204                          204             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052542  022704  165252                  CMP     #165252,%4      ;IS HIGH ORDER = 165252
052546  001403                          BEQ     .+10
052550  004767  006130                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052554  000205                          205             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052556  022705  100000                  CMP     #100000,%4:1    ;IS LOW ORDER = 100000
052562  001403                          BEQ     .+10
052564                          1$:
052564  004767  006114                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052570  000206                          206             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

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052572  021127  000232                CMP     (R1),#232               ;CHECK THE TEST NUMBER
052576  001372                        BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052600  010105                        MOV     R1,R5               ;RESTORE R5
052602  005215                        INC     (R5)


                              ;*****************************************************************
                              ;TEST:233       MUL     107070 * #107070 = 31222 26100      PS = 1
                              ;*****************************************************************

052604  010767  125362        TST233: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
052610  012700  107070                MOV     #107070,%0          ;LOAD MULTIPLICAND WITH 107070
052614  070027  107070                MUL     #107070,%0          ;MULTIPLY 107070 * #107070
052620  106737  042430                MFPS    @#PSWORD            ;SAVE PS
052624  122737  000001  042430        CMPB    #1,@#PSWORD         ;IS PS = 1
052632  001403                        BEQ     .+10
052634  004767  006044                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
052640  000207                        207             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

052642  022700  031222                CMP     #31222,%0           ;IS HIGH ORDER = 31222
052646  001403                        BEQ     .+10
052650  004767  006030                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;HIGH ORDER IS WRONG
052654  000210                        210             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

052656  022701  026100                CMP     #26100,%0.1         ;IS LOW ORDER = 26100
052662  001403                        BEQ     .+10
052664                        1$:
052664  004767  006014                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052670  000211                        211             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

052672  021527  000233                CMP     (R5),#233
052676  001372                        BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052700  005215                        INC     (R5)


                              ;*****************************************************************
                              ;TEST:234       MUL     -1 * #1 = -1 -1         PS = 10
                              ;*****************************************************************

052702  010767  125264        TST234: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
052706  012701  177777                MOV     #-1,%1              ;LOAD MULTIPLICAND WITH -1
052712  070127  000001                MUL     #1,%1               ;MULTIPLY -1 * #1
052716  106737  042430                MFPS    @#PSWORD            ;SAVE PS
052722  122737  000010  042430        CMPB    #10,@#PSWORD        ;IS PS = 10
052730  001403                        BEQ     .+10
052732  004767  005746                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
052736  000212                        212             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)
```

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052740  022701  177777                  CMP     #-1,%1          ;IS HIGH ORDER = -1
052744  001403                          BEQ     .+10
052746  004767  005732                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
052752  000213                          213             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052754  022701  177777                  CMP     #-1,%1!1        ;IS LOW ORDER - -1
052760  001403                          BEQ     .+10
052762                          1$:
052762  004767  005716                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052766  000214                          214             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052770  021527  000234                  CMP     (R5),#234
052774  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052776  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:235       MUL     -1 * #0 = 0 0           PS - 4
                                ;*******************************************************************

053000  010767  125166          TST235: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053004  012703  177777                  MOV     #-1,%3          ;LOAD MULTIPLICAND WITH -1
053010  070327  000000                  MUL     #0,%3           ;MULTIPLY -1 * #0
053014  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
053020  122737  000004  042430          CMPB    #4,@#PSWORD     ;IS PS = 4
053026  001403                          BEQ     .+10
053030  004767  005650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
053034  000215                          215             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053036  022703  000000                  CMP     #0,%3           ;IS HIGH ORDER = 0
053042  001403                          BEQ     .+10
053044  004767  005634                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
053050  000216                          216             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053052  022703  000000                  CMP     #0,%3!1         ;IS LOW ORDER - 0
053056  001403                          BEQ     .+10
053060                          1$:
053060  004767  005620                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053064  000217                          217             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053066  021527  000235                  CMP     (R5),#235
053072  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053074  005215                          INC     (R5)


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

```
                                        ;TEST:236       MUL     77777 * #100000 - 100000 100000         PS = 11
                                        ;*******************************************************************

053076  010767  125070                  TST236: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053102  010501                                  MOV     R5,R1           ;SAVE R5
053104  012705  077777                          MOV     #77777,%5       ;LOAD MULTIPLICAND WITH 77777
053110  070527  100000                          MUL     #100000,%5      ;MULTIPLY 77777 * #100000
053114  106737  042430                          MFPS    @#PSWORD        ;SAVE PS
053120  122737  000011  042430                  CMPB    #11,@#PSWORD    ;IS PS = 11
053126  001403                                  BEQ     .+10
053130  004767  005550                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
053134  000220                                  220             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053136  022705  100000                          CMP     #100000,%5      ;IS HIGH ORDER = 100000
053142  001403                                  BEQ     .+10
053144  004767  005534                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
053150  000221                                  221             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053152  022705  100000                          CMP     #100000,%5.1    ;IS LOW ORDER - 100000
053156  001403                                  BEQ     .+10
053160                                  1$:
053160  004767  005520                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053164  000222                                  222             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053166  021127  000236                          CMP     (R1),#236               ;CHECK THE TEST NUMBER
053172  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053174  010105                                  MOV     R1,R5           ;RESTORE R5
053176  005215                                  INC     (R5)


                                        ;*******************************************************************
                                        ;TEST:237       MUL     -1 * #77777 = 100001 100001             PS   10
                                        ;*******************************************************************

053200  010767  124766                  TST237: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053204  012701  177777                          MOV     #-1,%1          ;LOAD MULTIPLICAND WITH -1
053210  070127  077777                          MUL     #77777,%1       ;MULTIPLY -1 * #77777
053214  106737  042430                          MFPS    @#PSWORD        ;SAVE PS
053220  122737  000010  042430                  CMPB    #10,@#PSWORD    ;IS PS = 10
053226  001403                                  BEQ     .+10
053230  004767  005450                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
053234  000223                                  223             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053236  022701  100001                          CMP     #100001,%1      ;IS HIGH ORDER = 100001
053242  001403                                  BEQ     .+10
053244  004767  005434                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
053250  000224                                  224             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
```

```
                                                        ;BY  (013746  000172  000207)

053252  022701  100001                  CMP     #100001,%1.1    ;IS LOW ORDER - 100001
053256  001403                          BEQ     .+10
053260                          1$:
053260  004767  005420                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053264  000225                          225             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053266  021527  000237                  CMP     (R5),#237
053272  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053274  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:240       MUL     77777 * #77777 = 1 1        PS = 1
                                ;*******************************************************************

053276  010767  124670          TST240: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053302  012703  077777                  MOV     #77777,%3       ;LOAD MULTIPLICAND WITH 77777
053306  070327  077777                  MUL     #77777,%3       ;MULTIPLY 77777 * #77777
053312  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
053316  122737  000001  042430          CMPB    #1,@#PSWORD     ;IS PS = 1
053324  001403                          BEQ     .+10
053326  004767  005352                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
053332  000226                          226             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053334  022703  000001                  CMP     #1,%3           ;IS HIGH ORDER = 1
053340  001403                          BEQ     .+10
053342  004767  005336                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
053346  000227                          227             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053350  022703  000001                  CMP     #1,%3!1         ;IS LOW ORDER = 1
053354  001403                          BEQ     .+10
053356                          1$:
053356  004767  005322                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053362  000230                          230             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053364  021527  000240                  CMP     (R5),#240
053370  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053372  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:241       MUL     2 * #2 = 4 4        PS - 0
                                ;*******************************************************************

053374  010767  124572          TST241: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053400  010501                          MOV     R5,R1           ;SAVE R5
```

```
053402  012705  000002                  MOV     #2,%5           ;LOAD MULTIPLICAND WITH 2
053406  070527  000002                  MUL     #2,%5           ;MULTIPLY 2 * #2
053412  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
053416  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
053424  001403                          BEQ     .+10
053426  004767  005252                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
053432  000231                          231             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053434  022705  000004                  CMP     #4,%5           ;IS HIGH ORDER = 4
053440  001403                          BEQ     .+10
053442  004767  005236                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
053446  000232                          232             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053450  022705  000004                  CMP     #4,%5.1         ;IS LOW ORDER - 4
053454  001403                          BEQ     .+10
053456                          1$:
053456  004767  005222                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053462  000233                          233             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053464  021127  000241                  CMP     (R1),#241               ;CHECK THE TEST NUMBER
053470  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053472  010105                          MOV     R1,R5           ;RESTORE R5
053474  005215                          INC     (R5)


053476  012702  040000                  MOV     #40000,%2
053502  012703  042462                  MOV     #S5,%3
053506  012704  042464                  MOV     #S6,%4

                                ;*****************************************************************
                                ;TEST:242       MUL     125252 * S5 - 165252 100000     PS   11
                                ;*****************************************************************

053512  010767  124454          TST242: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053516  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
053522  070067  166734                  MUL     S5,%0           ;MULTIPLY 125252 * S5
053526  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
053532  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
053540  001403                          BEQ     .+10
053542  004767  005136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
053546  000234                          234             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053550  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
053554  001403                          BEQ     .+10
053556  004767  005122                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
053562  000235                          235             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
053564  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER = 100000
053570  001403                          BEQ     .+10
053572                          1$:
053572  004767  005106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053576  000236                          236             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053600  021527  000242                  CMP     (R5),#242
053604  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053606  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:243       MUL     125252 * @S6 - 165252 100000        PS = 11
                                ;*****************************************************************

053610  010767  124356          TST243: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053614  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
053620  070077  166640                  MUL     @S6,%0          ;MULTIPLY 125252 * @S6
053624  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
053630  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
053636  001403                          BEQ     .+10
053640  004767  005040                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
053644  000237                          237             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053646  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
053652  001403                          BEQ     .+10
053654  004767  005024                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
053660  000240                          240             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053662  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER - 100000
053666  001403                          BEQ     .+10
053670                          1$:
053670  004767  005010                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053674  000241                          241             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053676  021527  000243                  CMP     (R5),#243
053702  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053704  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:244       MUL     125252 * @#S5 = 165252 100000       PS   11
                                ;*****************************************************************

053706  010767  124260          TST244: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053712  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
053716  070037  042462                  MUL     @#S5,%0         ;MULTIPLY 125252 * @#S5
```

```
053722  106737  042430                  MFPS    @#PSWORD          ;SAVE PS
053726  122737  000011  042430          CMPB    #11,@#PSWORD      ;IS PS = 11
053734  001403                          BEQ     .+10
053736  004767  004742                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
053742  000242                          242             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053744  022700  165252                  CMP     #165252,%0        ;IS HIGH ORDER = 165252
053750  001403                          BEQ     .+10
053752  004767  004726                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;HIGH ORDER IS WRONG
053756  000243                          243             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053760  022701  100000                  CMP     #100000,%0!1      ;IS LOW ORDER = 100000
053764  001403                          BEQ     .+10
053766                          1$:
053766  004767  004712                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053772  000244                          244             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053774  021527  000244                  CMP     (R5),#244
054000  001372                          BNE     1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054002  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:245       MUL     125252 * %2 = 165252 100000     PS   11
                                ;*******************************************************************

054004  010767  124162          TST245: MOV     PC,LPADR          ;STORE ERROR LOOP ADDPESS
054010  012700  125252                  MOV     #125252,%0        ;LOAD MULTIPLICAND WITH 125252
054014  070002                          MUL     %2,%0             ;MULTIPLY 125252 * %2
054016  106737  042430                  MFPS    @#PSWORD          ;SAVE PS
054022  122737  000011  042430          CMPB    #11,@#PSWORD      ;IS PS = 11
054030  001403                          BEQ     .+10
054032  004767  004646                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
054036  000245                          245             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054040  022700  165252                  CMP     #165252,%0        ;IS HIGH ORDER = 165252
054044  001403                          BEQ     .+10
054046  004767  004632                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;HIGH ORDER IS WRONG
054052  000246                          246             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054054  022701  100000                  CMP     #100000,%0.1      ;IS LOW ORDER = 100000
054060  001403                          BEQ     .+10
054062                          1$:
054062  004767  004616                  JSR     PC,$HLT;SFEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054066  000247                          247             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
```

```
                                                                ;BY  (013746  000172  000207)

054070  021527  000245                  CMP     (R5),#245
054074  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054076  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:246       MUL     125252 * (3)+ = 165252 100000       PS - 11
                                ;*******************************************************************

054100  010767  124066          TST246: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054104  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
054110  070023                          MUL     (3)+,%0         ;MULTIPLY 125252 * (3)+
054112  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
054116  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
054124  001403                          BEQ     .+10
054126  004767  004552                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
054132  000250                          250             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054134  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
054140  001403                          BEQ     .+10
054142  004767  004536                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
054146  000251                          251             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054150  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER - 100000
054154  001403                          BEQ     .+10
054156                          1$:
054156  004767  004522                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054162  000252                          252             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054164  021527  000246                  CMP     (R5),#246
054170  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054172  005215                          INC     (R5)


                                ;*******************************************************************
                                ;TEST:247       MUL     125252 * -(3) = 165252 100000       PS   11
                                ;*******************************************************************

054174  010767  123772          TST247: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054200  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
054204  070043                          MUL     -(3),%0         ;MULTIPLY 125252 * -(3)
054206  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
054212  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
054220  001403                          BEQ     .+10
054222  004767  004456                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
054226  000253                          253             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
054230  022700  165252                CMP     #165252,%0      ;IS HIGH ORDER = 165252
054234  001403                        BEQ     .+10
054236  004767  004442                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;HIGH ORDER IS WRONG
054242  000254                        254             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

054244  022701  100000                CMP     #100000,%0.1    ;IS LOW ORDER = 100000
054250  001403                        BEQ     .+10
054252                          1$:
054252  004767  004426                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054256  000255                        255             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

054260  021527  000247                CMP     (R5),#247
054264  001372                        BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054266  005215                        INC     (R5)


                                ;*******************************************************************
                                ;TEST:250       MUL     125252 * 2(4) = 165252 100000           PS   11
                                ;*******************************************************************

054270  010767  123676          TST250: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054274  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
054300  070064  000002                  MUL     2(4),%0         ;MULTIPLY 125252 * 2(4)
054304  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
054310  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
054316  001403                          BEQ     .+10
054320  004767  004360                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
054324  000256                          256             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054326  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
054332  001403                          BEQ     .+10
054334  004767  004344                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
054340  000257                          257             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054342  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER   100000
054346  001403                          BEQ     .+10
054350                          1$:
054350  004767  004330                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054354  000260                          260             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054356  021527  000250                  CMP     (R5),# 50
054362  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054364  005215                          INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:251       MUL     125252 * @(4) = 165252 100000       PS   11
                                        ;*******************************************************************

054366  010767  123600          TST251: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054372  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
054376  070074  000000                  MUL     @(4),%0         ;MULTIPLY 125252 * @(4)
054402  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
054406  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
054414  001403                          BEQ     .+10
054416  004767  004262                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
054422  000261                          261             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054424  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
054430  001403                          BEQ     .+10
054432  004767  004246                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
054436  000262                          262             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054440  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER   100000
054444  001403                          BEQ     .+10
054446                          1$:
054446  004767  004232                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054452  000263                          263             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054454  021527  000251                  CMP     (R5),#251
054460  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054462  005215                          INC     (R5)


                                        ;*******************************************************************
                                        ;TEST:252       MUL     125252 * @(4)+ = 165252 100000      PS   11
                                        ;*******************************************************************

054464  010767  123502          TST252: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054470  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
054474  070034                          MUL     @(4)+,%0        ;MULTIPLY 125252 * @(4)+
054476  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
054502  122737  000011  042430          CMPB    #11,@#PSWORD    ;IS PS = 11
054510  001403                          BEQ     .+10
054512  004767  004166                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
054516  000264                          264             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054520  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER - 165252
054524  001403                          BEQ     .+10
054526  004767  004152                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
054532  000265                          265             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
054534  022701  100000                  CMP     #100000,%0.1     ;IS LOW ORDER = 100000
054540  001403                          BEQ     .+10
054542                          1$:
054542  004767  004136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054546  000266                          266             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054550  021527  000252                  CMP     (R5),#252
054554  001372                          BNE     1$               ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054556  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:253       MUL     125252 * @-(4) - 165252 100000          PS   11
                                ;*****************************************************************

054560  010767  123406          TST253: MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
054564  012700  125252                  MOV     #125252,%0       ;LOAD MULTIPLICAND WITH 125252
054570  070054                          MUL     @-(4),%0         ;MULTIPLY 125252 * @-(4)
054572  106737  042430                  MFPS    @#PSWORD         ;SAVE PS
054576  122737  000011  042430          CMPB    #11,@#PSWORD     ;IS PS = 11
054604  001403                          BEQ     .+10
054606  004767  004072                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;PS IS WRONG
054612  000267                          267             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054614  022700  165252                  CMP     #165252,%0       ;IS HIGH ORDER = 165252
054620  001403                          BEQ     .+10
054622  004767  004056                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;HIGH ORDER IS WRONG
054626  000270                          270             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


054630  022701  100000                  CMP     #100000,%0.1     ;IS LOW ORDER = 100000
054634  001403                          BEQ     .+10
054636                          1$:
054636  004767  004042                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054642  000271                          271             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


054644  021527  000253                  CMP     (R5),#253
054650  001372                          BNE     1$               ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054652  005215                          INC     (R5)
```

```
                                                        ;*****************************
                                                        ;     DIV INSTRUCTION TESTS
                                                        ;*****************************


                                        ;*****************************************************************
                                        ;TEST:254      DIV     0 4 / #2 = 2       REM = 0      PS = 0
                                        ;*****************************************************************

054654  010767  123312          TST254: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054660  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
054664  012701  000004                  MOV     #4,%0+1         ;LOAD LOW ORDER WITH 4
054670  071027  000002                  DIV     #2,%0           ;DIVIDE BY #2
054674  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

054700  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
054706  001403                          BEQ     .+10
054710  004767  003770                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
054714  000272                          272             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


054716  022700  000002                  CMP     #2,%0           ;IS QUOTIENT - 2
054722  001403                          BEQ     .+10
054724  004767  003754                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
054730  000273                          273             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


054732  022701  000000                  CMP     #0,%0+1         ;IS REMAINDER - 0
054736  001403                          BEQ     .+10
054740  004767  003740                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
054744  000274                          274             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054746  021527  000254                  CMP     (R5),#254
054752  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
054754  004767  003724                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
054760  000275                          275             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054762  005215                          INC     (R5)

                                        ;*****************************************************************
                                        ;TEST:255      DIV     -1 -9. / #3 = -3       REM = 0      PS = 10
                                        ;*****************************************************************

054764  010767  123202          TST255: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
054770  012702  177777                  MOV     #-1,%2          ;LOAD HIGH ORDER WITH -1
054774  012703  177767                  MOV     #-9.,%2+1       ;LOAD LOW ORDER WITH -9.
055000  071227  000003                  DIV     #3,%2           ;DIVIDE BY #3
```

```
055004  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055010  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS PS = 10
055016  001403                          BEQ     .+10
055020  004767  003660                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055024  000276                          276             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055026  022702  177775                  CMP     #-3,%2          ;IS QUOTIENT - -3
055032  001403                          BEQ     .+10
055034  004767  003644                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
055040  000277                          277             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055042  022703  000000                  CMP     #0,%2+1         ;IS REMAINDER = 0
055046  001403                          BEQ     .+10
055050  004767  003630                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055054  000300                          300             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055056  021527  000255                  CMP     (R5),#255
055062  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055064  004767  003614                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
055070  000301                          301             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055072  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:256       DIV     0 9. / #2 = 4       REM   1       PS - 0
                                ;*****************************************************************

055074  010767  123072          TST256: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055100  010501                          MOV     R5,R1           ;SAVE R5
055102  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
055106  012705  000011                  MOV     #9.,%4+1        ;LOAD LOW ORDER WITH 9.
055112  071427  000002                  DIV     #2,%4           ;DIVIDE BY #2
055116  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055122  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
055130  001403                          BEQ     .+10
055132  004767  003546                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055136  000302                          302             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055140  022704  000004                  CMP     #4,%4           ;IS QUOTIENT = 4
055144  001403                          BEQ     .+10
055146  004767  003532                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

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                                                                ;QUOTIENT IS WRONG
055152  000303                          303             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055154  022705  000001                  CMP     #1,%4+1         ;IS REMAINDER = 1
055160  001403                          BEQ     .+10
055162  004767  003516                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055166  000304                          304             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055170  010105                          MOV     R1,R5           ;RESTORE R5
055172  021527  000256                  CMP     (R5),#256
055176  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055200  004767  003500                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
055204  000305                          305             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055206  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:257       DIV     -1 -9. / #2 = -4        REM = -1        PS - 10
                                ;*******************************************************************

055210  010767  122756          TST257: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055214  012700  177777                  MOV     #-1,%0          ;LOAD HIGH ORDER WITH -1
055220  012701  177767                  MOV     #-9.,%0+1       ;LOAD LOW ORDER WITH -9.
055224  071027  000002                  DIV     #2,%0           ;DIVIDE BY #2
055230  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055234  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS PS = 10
055242  001403                          BEQ     .+10
055244  004767  003434                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055250  000306                          306             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055252  022700  177774                  CMP     #-4,%0          ;IS QUOTIENT = -4
055256  001403                          BEQ     .+10
055260  004767  003420                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
055264  000307                          307             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055266  022701  177777                  CMP     #-1,%0+1        ;IS REMAINDER = -1
055272  001403                          BEQ     .+10
055274  004767  003404                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055300  000310                          310             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055302  021527  000257                  CMP     (R5),#257
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055306  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055310  004767  003370                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
055314  000311                          311             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055316  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:260       DIV     0 2 / #-3 - 0       REM = 2       PS   4
                                ;*******************************************************************

055320  010767  122646          TST260: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055324  012702  000000                  MOV     #0,%2           ;LOAD HIGH ORDER WITH 0
055330  012703  000002                  MOV     #2,%2+1         ;LOAD LOW ORDER WITH 2
055334  071227  177775                  DIV     #-3,%2          ;DIVIDE BY #-3
055340  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055344  122737  000004  042430          CMPB    #4,@#PSWORD     ;IS PS = 4
055352  001403                          BEQ     .+10
055354  004767  003324                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055360  000312                          312             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055362  022702  000000                  CMP     #0,%2           ;IS QUOTIENT = 0
055366  001403                          BEQ     .+10
055370  004767  003310                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
055374  000313                          313             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055376  022703  000002                  CMP     #2,%2+1         ;IS REMAINDER = 2
055402  001403                          BEQ     .+10
055404  004767  003274                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055410  000314                          314             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055412  021527  000260                  CMP     (R5),#260
055416  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055420  004767  003260                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
055424  000315                          315             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055426  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:261       DIV     -1 -2 / #3 = 0      REM = -2      PS - 4
                                ;*******************************************************************

055430  010767  122536          TST261: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055434  010501                          MOV     R5,R1           ;SAVE R5
```

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055436  012704  177777                  MOV     #-1,%4          ;LOAD HIGH ORDER WITH -1
055442  012705  177776                  MOV     #-2,%4+1        ;LOAD LOW ORDER WITH -2
055446  071427  000003                  DIV     #3,%4           ;DIVIDE BY #3
055452  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055456  122737  000004  042430          CMPB    #4,@#PSWORD     ;IS PS = 4
055464  001403                          BEQ     .+10
055466  004767  003212                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055472  000316                          316             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055474  022704  000000                  CMP     #0,%4           ;IS QUOTIENT = 0
055500  001403                          BEQ     .+10
055502  004767  003176                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
055506  000317                          317             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055510  022705  177776                  CMP     #-2,%4+1        ;IS REMAINDER = -2
055514  001403                          BEQ     .+10
055516  004767  003162                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055522  000320                          320             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055524  010105                          MOV     R1,R5           ;RESTORE R5
055526  021527  000261                  CMP     (R5),#261
055532  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055534  004767  003144                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
055540  000321                          321             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055542  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:262       DIV     -1 -1 / #1 = -1         REM = 0         PS   10
                                ;*******************************************************************

055544  010767  122422          TST262: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055550  012700  177777                  MOV     #-1,%0          ;LOAD HIGH ORDER WITH -1
055554  012701  177777                  MOV     #-1,%0+1        ;LOAD LOW ORDER WITH -1
055560  071027  000001                  DIV     #1,%0           ;DIVIDE BY #1
055564  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055570  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS PS = 10
055576  001403                          BEQ     .+10
055600  004767  003100                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055604  000322                          322             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
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055606  022700  177777                CMP     #-1,%0          ;IS QUOTIENT - -1
055612  001403                        BEQ     .+10
055614  004767  003064                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;QUOTIENT IS WRONG
055620  000323                        323             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)


055622  022701  000000                CMP     #0,%0+1         ;IS REMAINDER = 0
055626  001403                        BEQ     .+10
055630  004767  003050                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;WRONG REMAINDER
055634  000324                        324             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

055636  021527  000262                CMP     (R5),#262
055642  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055644  004767  003034                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;TEST IS IN WRONG SEQUENCE
055650  000325                        325             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

055652  005215                        INC     (R5)

                                ;*******************************************************************
                                ;TEST:263       DIV     0 0 / #1 = 0        REM = 0       PS   4
                                ;*******************************************************************

055654  010767  122312          TST263: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055660  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
055664  012701  000000                  MOV     #0,%0+1         ;LOAD LOW ORDER WITH 0
055670  071027  000001                  DIV     #1,%0           ;DIVIDE BY #1
055674  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

055700  122737  000004  042430          CMPB    #4,@#PSWORD     ;IS PS = 4
055706  001403                          BEQ     .+10
055710  004767  002770                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055714  000326                          326             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055716  022700  000000                  CMP     #0,%0           ;IS QUOTIENT = 0
055722  001403                          BEQ     .+10
055724  004767  002754                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
055730  000327                          327             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055732  022701  000000                  CMP     #0,%0+1         ;IS REMAINDER = 0
055736  001403                          BEQ     .+10
055740  004767  002740                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055744  000330                          330             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
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055746  021527  000263                CMP     (R5),#263
055752  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055754  004767  002724                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;TEST IS IN WRONG SEQUENCE
055760  000331                        331             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

055762  005215                        INC     (R5)

                              ;*******************************************************************
                              ;TEST:264      DIV     -1 125252 / #2 = 152525       REM - 0      PS   10
                              ;*******************************************************************

055764  010767  122202        TST264: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055770  012702  177777                MOV     #-1,%2          ;LOAD HIGH ORDER WITH -1
055774  012703  125252                MOV     #125252,%2+1    ;LOAD LOW ORDER WITH 125252
056000  071227  000002                DIV     #2,%2           ;DIVIDE BY #2
056004  106737  042430                MFPS    @#PSWORD        ;SAVE PS

056010  122737  000010  042430        CMPB    #10,@#PSWORD    ;IS PS = 10
056016  001403                        BEQ     .+10
056020  004767  002660                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;PS IS WRONG
056024  000332                        332             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)


056026  022702  152525                CMP     #152525,%2      ;IS QUOTIENT = 152525
056032  001403                        BEQ     .+10
056034  004767  002644                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;QUOTIENT IS WRONG
056040  000333                        333             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)


056042  022703  000000                CMP     #0,%2+1         ;IS REMAINDER = 0
056046  001403                        BEQ     .+10
056050  004767  002630                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;WRONG REMAINDER
056054  000334                        334             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

056056  021527  000264                CMP     (R5),#264
056062  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056064  004767  002614                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;TEST IS IN WRONG SEQUENCE
056070  000335                        335             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

056072  005215                        INC     (R5)

                              ;*******************************************************************
                              ;TEST:265      DIV     -1 -1 / #-1 = 1       REM - 0      PS   0
                              ;*******************************************************************
```

```
056074  010767  122072          TST265: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056100  010501                          MOV     R5,R1           ;SAVE R5
056102  012704  177777                  MOV     #-1,%4          ;LOAD HIGH ORDER WITH -1
056106  012705  177777                  MOV     #-1,%4+1        ;LOAD LOW ORDER WITH -1
056112  071427  177777                  DIV     #-1,%4          ;DIVIDE BY #-1
056116  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

056122  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
056130  001403                          BEQ     .+10
056132  004767  002546                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
056136  000336                          336             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056140  022704  000001                  CMP     #1,%4           ;IS QUOTIENT = 1
056144  001403                          BEQ     .+10
056146  004767  002532                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056152  000337                          337             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056154  022705  000000                  CMP     #0,%4+1         ;IS REMAINDER = 0
056160  001403                          BEQ     .+10
056162  004767  002516                  JSR     PC,$HLT,SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
056166  000340                          340             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056170  010105                          MOV     R1,R5           ;RESTORE R5
056172  021527  00026                   CMP     (R5),#265
056176  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056200  004767  002500                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056204  000341                          341             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056206  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:266       DIV     25253 1 / #125252 = 100000      REM = 1      PS - 10
                                ;*****************************************************************

056210  010767  121756          TST266: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056214  012700  025253                  MOV     #25253,%0       ;LOAD HIGH ORDER WITH 25253
056220  012701  000001                  MOV     #1,%0+1         ;LOAD LOW ORDER WITH 1
056224  071027  125252                  DIV     #125252,%0      ;DIVIDE BY #125252
056230  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

056234  122737  000010  042430          CMPB    #10,@#PSWORD    ;IS PS = 10
056242  001403                          BEQ     .+10
056244  004767  002434                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
056250  000342                          342             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
056252  022700  100000                  CMP     #100000,%0      ;IS QUOTIENT = 100000
056256  001403                          BEQ     .+10
056260  004767  002420                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056264  000343                          343             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056266  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
056272  001403                          BEQ     .+10
056274  004767  002404                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
056300  000344                          344             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056302  021527  000266                  CMP     (R5),#266
056306  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056310  004767  002370                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056314  000345                          345             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056316  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:267       DIV     37777 77777 / #77777 = 77777        REM - 77776     PS = 0
                                ;*****************************************************************

056320  010767  121646          TST267: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056324  012702  037777                  MOV     #37777,%2       ;LOAD HIGH ORDER WITH 37777
056330  012703  077777                  MOV     #77777,%2+1     ;LOAD LOW ORDER WITH 77777
056334  071227  077777                  DIV     #77777,%2       ;DIVIDE BY #77777
056340  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

056344  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
056352  001403                          BEQ     .+10
056354  004767  002324                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
056360  000346                          346             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056362  022702  077777                  CMP     #77777,%2       ;IS QUOTIENT = 77777
056366  001403                          BEQ     .+10
056370  004767  002310                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056374  000347                          347             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056376  022703  077776                  CMP     #77776,%2+1     ;IS REMAINDER = 77776
056402  001403                          BEQ     .+10
056404  004767  002274                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
```

```
056410  000350                          350             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056412  021527  000267                  CMP     (R5),#267
056416  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056420  004767  002260                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056424  000351                          351             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056426  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:270       DIV     0 100000 / #2 = 40000       REM   0       PS   0
                                ;*******************************************************************

056430  010767  121536          TST270: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056434  010501                          MOV     R5,R1           ;SAVE R5
056436  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
056442  012705  100000                  MOV     #100000,%4+1    ;LOAD LOW ORDER WITH 100000
056446  071427  000002                  DIV     #2,%4           ;DIVIDE BY #2
056452  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

056456  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
056464  001403                          BEQ     .+10
056466  004767  002212                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
056472  000352                          352             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056474  022704  040000                  CMP     #40000,%4       ;IS QUOTIENT = 40000
056500  001403                          BEQ     .+10
056502  004767  002176                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056506  000353                          353             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056510  022705  000000                  CMP     #0,%4+1         ;IS REMAINDER = 0
056514  001403                          BEQ     .+10
056516  004767  002162                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
056522  000354                          354             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056524  010105                          MOV     R1,R5           ;RESTORE R5
056526  021527  000270                  CMP     (R5),#270
056532  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056534  004767  002144                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056540  000355                          355             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056542  005215                          INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:271      DIV     177777 77777 / #177776 = 40000       REM - 177777      PS
                                        ;*******************************************************************

056544  010767  121422          TST271: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056550  012700  177777                  MOV     #177777,%0      ;LOAD HIGH ORDER WITH 177777
056554  012701  077777                  MOV     #77777,%0+1     ;LOAD LOW ORDER WITH 77777
056560  071027  177776                  DIV     #177776,%0      ;DIVIDE BY #177776
056564  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

056570  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
056576  001403                          BEQ     .+10
056600  004767  002100                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
056604  000356                          356             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056606  022700  040000                  CMP     #40000,%0       ;IS QUOTIENT - 40000
056612  001403                          BEQ     .+10
056614  004767  002064                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056620  000357                          357             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056622  022701  177777                  CMP     #177777,%0+1    ;IS REMAINDER = 177777
056626  001403                          BEQ     .+10
056630  004767  002050                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
056634  000360                          360             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056636  021527  000271                  CMP     (R5),#271
056642  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056644  004767  002034                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056650  000361                          361             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056652  005215                          INC     (R5)

                                        ;*******************************************************************
                                        ;TEST:272      DIV     0 52525 / #52525 - 1       REM   0      PS   0
                                        ;*******************************************************************

056654  010767  121312          TST272: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056660  012702  000000                  MOV     #0,%2           ;LOAD HIGH ORDER WITH 0
056664  012703  052525                  MOV     #52525,%2+1     ;LOAD LOW ORDER WITH 52525
056670  071227  052525                  DIV     #52525,%2       ;DIVIDE BY #52525
056674  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

056700  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS - 0
056706  001403                          BEQ     .+10
056710  004767  001770                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
```

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056714  000362                          362             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056716  022702  000001                  CMP     #1,%2           ;IS QUOTIENT = 1
056722  001403                          BEQ     .+10
056724  004767  001754                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056730  000363                          363             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056732  022703  000000                  CMP     #0,%2+1         ;IS REMAINDER = 0
056736  001403                          BEQ     .+10
056740  004767  001740                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
056744  000364                          364             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056746  021527  000272                  CMP     (R5),#272
056752  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056754  004767  001724                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056760  000365                          365             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056762  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:273       DIV     0 77777 / #0 = DUMMY        REM   DUMMY      PS   3
                                ;*******************************************************************

056764  010767  121202          TST273: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056770  010501                          MOV     R5,R1           ;SAVE R5
056772  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
056776  012705  077777                  MOV     #77777,%4+1     ;LOAD LOW ORDER WITH 77777
057002  071427  000000                  DIV     #0,%4           ;DIVIDE BY #0
057006  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
057012  042737  000014  042430          BIC     #14,@#PSWORD

057020  122737  000003  042430          CMPB    #3,@#PSWORD     ;IS PS = 3
057026  001403                          BEQ     .+10
057030  004767  001650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057034  000366                          366             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057036  010105                          MOV     R1,R5           ;RESTORE R5
057040  021527  000273                  CMP     (R5),#273
057044  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057046  004767  001632                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057052  000367                          367             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
057054  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:274       DIV     77777 177777 / #2   DUMMY       REM   DUMMY      PS - 2
                                ;*****************************************************************

057056  010767  121110          TST274: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057062  012700  077777                  MOV     #77777,%0       ;LOAD HIGH ORDER WITH 77777
057066  012701  177777                  MOV     #177777,%0+1    ;LOAD LOW ORDER WITH 177777
057072  071027  000002                  DIV     #2,%0           ;DIVIDE BY #2
057076  106737  042430                  MFPS    @#PSWORD        ;SAVE PS
057102  042737  000014  042430          BIC     #14,@#PSWORD

057110  122737  000002  042430          CMPB    #2,@#PSWORD     ;IS PS = 2
057116  001403                          BEQ     .+10
057120  004767  001560                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057124  000370                          370             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057126  021527  000274                  CMP     (R5),#274
057132  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057134  004767  001544                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057140  000371                          371             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057142  005215                          INC     (R5)

057144  012702  000002                  MOV     #2,%2
057150  012703  042472                  MOV     #S9,%3
057154  012704  042474                  MOV     #S10,%4

                                ;*****************************************************************
                                ;TEST:275       DIV     0 52525 / S9 = 25252        REM   1       PS   0
                                ;*****************************************************************

057160  010767  121006          TST275: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057164  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057170  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057174  071067  163272                  DIV     S9,%0           ;DIVIDE BY S9
057200  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

057204  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
057212  001403                          BEQ     .+10
057214  004767  001464                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057220  000372                          372             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057222  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
057226  001403                          BEQ     .+10
057230  004767  001450                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
```

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057234  000373                          373             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057236  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
057242  001403                          BEQ     .+10
057244  004767  001434                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
057250  000374                          374             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057252  021527  000275                  CMP     (R5),#275
057256  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057260  004767  001420                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057264  000375                          375             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057266  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:276       DIV     0 52525 / @S10 = 25252          REM - 1         PS - 0
                                ;*******************************************************************

057270  010767  120676          TST276: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057274  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057300  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057304  071077  163164                  DIV     @S10,%0         ;DIVIDE BY @S10
057310  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

057314  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
057322  001403                          BEQ     .+10
057324  004767  001354                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057330  000376                          376             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057332  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT - 25252
057336  001403                          BEQ     .+10
057340  004767  001340                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
057344  000377                          377             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057346  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER - 1
057352  001403                          BEQ     .+10
057354  004767  001324                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
057360  000400                          400             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057362  021527  000276                  CMP     (R5),#276
057366  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057370  004767  001310                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

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                                                                ;TEST IS IN WRONG SEQUENCE
057374  000401                          401             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057376  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:277       DIV     0 52525 / @#S9 = 25252          REM   1         PS   0
                                ;*****************************************************************

057400  010767  120566          TST277: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057404  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057410  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057414  071037  042472                  DIV     @#S9,%0         ;DIVIDE BY @#S9
057420  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

057424  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
057432  001403                          BEQ     .+10
057434  004767  001244                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057440  000402                          402             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057442  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
057446  001403                          BEQ     .+10
057450  004767  001230                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
057454  000403                          403             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057456  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
057462  001403                          BEQ     .+10
057464  004767  001214                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
057470  000404                          404             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057472  021527  000277                  CMP     (R5),#277
057476  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057500  004767  001200                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057504  000405                          405             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057506  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:300       DIV     0 52525 / %2 = 25252            REM = 1         PS   0
                                ;*****************************************************************

057510  010767  120456          TST300: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057514  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057520  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057524  071002                          DIV     %2,%0           ;DIVIDE BY %2
```

```
057526  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

057532  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
057540  001403                          BEQ     .+10
057542  004767  001136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057546  000406                          406             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057550  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT - 25252
057554  001403                          BEQ     .+10
057556  004767  001122                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
057562  000407                          407             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057564  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
057570  001403                          BEQ     .+10
057572  004767  001106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
057576  000410                          410             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057600  021527  000300                  CMP     (R5),#300
057604  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057606  004767  001072                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057612  000411                          411             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057614  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:301       DIV     0 52525 / (3)+ = 25252          REM - 1         PS   0
                                ;*****************************************************************

057616  010767  120350          TST301: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057622  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057626  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057632  071023                          DIV     (3)+,%0         ;DIVIDE BY (3)+
057634  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

057640  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
057646  001403                          BEQ     .+10
057650  004767  001030                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057654  000412                          412             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057656  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
057662  001403                          BEQ     .+10
057664  004767  001014                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
```

```
057670  000413                          413             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057672  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER   1
057676  001403                          BEQ     .+10
057700  004767  001000                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
057704  000414                          414             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057706  021527  000301                  CMP     (R5),#301
057712  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057714  004767  000764                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057720  000415                          415             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057722  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:302       DIV     0 52525 / -(3) = 25252          REM = 1         PS - 0
                                ;*****************************************************************

057724  010767  120242          TST302: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057730  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057734  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057740  071043                          DIV     -(3),%0         ;DIVIDE BY -(3)
057742  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

057746  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
057754  001403                          BEQ     .+10
057756  004767  000722                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057762  000416                          416             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057764  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
057770  001403                          BEQ     .+10
057772  004767  000706                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
057776  000417                          417             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060000  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
060004  001403                          BEQ     .+10
060006  004767  000672                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
060012  000420                          420             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060014  021527  000302                  CMP     (R5),#302
060020  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
060022  004767  000656                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
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                                                        ;TEST IS IN WRONG SEQUENCE
060026  000421                          421             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060030  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:303       DIV     0 52525 / 2(4) = 25252          REM - 1         PS   0
                                ;*****************************************************************

060032  010767  120134          TST303: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
060036  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
060042  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
060046  071064  000002                  DIV     2(4),%0         ;DIVIDE BY 2(4)
060052  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

060056  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
060064  001403                          BEQ     .+10
060066  004767  000612                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
060072  000422                          422             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060074  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
060100  001403                          BEQ     .+10
060102  004767  000576                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
060106  000423                          423             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060110  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
060114  001403                          BEQ     .+10
060116  004767  000562                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
060122  000424                          424             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060124  021527  000303                  CMP     (R5),#303
060130  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
060132  004767  000546                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
060136  000425                          425             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060140  005215                          INC     (R5)

                                ;*****************************************************************
                                ;TEST:304       DIV     0 52525 / @(4) = 25252          REM = 1         PS   C
                                ;*****************************************************************

060142  010767  120024          TST304: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
060146  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
060152  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
060156  071074  000000                  DIV     @(4),%0         ;DIVIDE BY @(4)
```

```
060162  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

060166  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS - 0
060174  001403                          BEQ     .+10
060176  004767  000502                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
060202  000426                          426             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060204  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
060210  001403                          BEQ     .+10
060212  004767  000466                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
060216  000427                          427             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060220  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
060224  001403                          BEQ     .+10
060226  004767  000452                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
060232  000430                          430             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060234  021527  000304                  CMP     (R5),#304
060240  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
060242  004767  000436                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
060246  000431                          431             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060250  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:305       DIV     0 52525 / @(4)+ = 25252        REM   1       PS - 0
                                ;*******************************************************************

060252  010767  117714          TST305: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
060256  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
060262  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
060266  071034                          DIV     @(4)+,%0        ;DIVIDE BY @(4)+
060270  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

060274  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
060302  001403                          BEQ     .+10
060304  004767  000374                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
060310  000432                          432             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060312  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
060316  001403                          BEQ     .+10
060320  004767  000360                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
```

```
060324  000433                          433             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060326  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
060332  001403                          BEQ     .+10
060334  004767  000344                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
060340  000434                          434             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060342  021527  000305                  CMP     (R5),#305
060346  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
060350  004767  000330                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
060354  000435                          435             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060356  005215                          INC     (R5)


                                ;*****************************************************************
                                ;TEST:306       DIV     0 52525 / @-(4) = 25252        REM - 1       PS   0
                                ;*****************************************************************

060360  010767  117606          TST306: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
060364  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
060370  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
060374  071054                          DIV     @-(4),%0        ;DIVIDE BY @-(4)
060376  106737  042430                  MFPS    @#PSWORD        ;SAVE PS

060402  122737  000000  042430          CMPB    #0,@#PSWORD     ;IS PS = 0
060410  001403                          BEQ     .+10
060412  004767  000266                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
060416  000436                          436             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060420  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
060424  001403                          BEQ     .+10
060426  004767  000252                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
060432  000437                          437             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060434  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
060440  001403                          BEQ     .+10
060442  004767  000236                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
060446  000440                          440             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


060450  021527  000306                  CMP     (R5),#306
060454  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
060456  004767  000222                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
                                                                    ;TEST IS IN WRONG SEQUENCE
060462  000441                          441                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

060464  005215                          INC     (R5)
```

```
                                        .SBTTL  END OF PASS ROUTINE
                                        ;*******************************************************************************
                                        ;*INCREMENT THE PASS NUMBER ($PASS) IN APT MAILBOX
                                        ;*TYPE 'END PASS #XXXXX' (WHERE XXXXX IS A DECIMAL NUMBER)
                                        ;*IF THERE IS A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO RESTART
                                        ;*******************************************************************************

060466  005227  177777          $EOP:   INC     #-1             ;TYPE ID ONLY ON FIRST PASS
060472  001002                          BNE     SKPMSG          ;BRANCH AROUND AFTER FIRST PASS
060474  104401  060642                  TYPE    ,MSG1           ;TYPE TITLE
060500  005267  117602          SKPMSG: INC     $PASS           ;INCREMENT THE PASS NUMBER
060504  042767  100000  117574          BIC     #100000,$PASS   ;DON'T LET COUNT GO NEGATIVE
060512  005327                          DEC     (PC)+           ;LOOP?
060514  000001                  $EOPCT: .WORD   1
060516  003037                          BGT     $DOAGN          ;YES
060520  012737                          MOV     (PC)+,@(PC)+    ;RESTORE LOOP COUNTER
060522  000016                  $ENDCT: .WORD   16
060524  060514                          $EOPCT
060526  104401  060625                  TYPE    ,$ENDMG         ;TYPE 'END PASS #'
060532  016746  117550                  MOV     $PASS,-(SP)     ;SAVE PASS COUNT FOR TYPEOUT
060536  104405                          TYPDS                   ;GO TYPE PASS COUNT IN DECIMAL
060540  104401  060622                  TYPE    ,$ENULL         ;TYPE A FEW NULL CHARACTERS
060544  013700  000042          $GET42: MOV     @#42,R0         ;GET MONITOR ADDRESS
060550  001405                          BEQ     DOAGIN          ;BRANCH IF NO MONITOR
060552  000005                          RESET                   ;CLEAR THE WORLD
060554  004710                  $ENDAD: JSR     PC,(R0)         ;GO TO MONITOR
060556  000240                          NOP                     ;SAVE ROOM
060560  000240                          NOP                     ;FOR
060562  000240                          NOP                     ;ACT11
060564  013746  000004          DOAGIN: MOV     @#4,-(SP)       ;SAVE CONTENTS OF LOCATION 4
060570  012737  060606  000004          MOV     #1$,@#4         ;SET UP IN CASE OF TRAP
060576  012737  000001  164000          MOV     #1,@#164000     ;NOTIFY MULTI-TESTER WE'RE DONE
060604  000402                          BR      2$              ;NO TRAP SO DON'T RESET STACK
060606  062706  000004          1$:     ADD     #4,SP           ;RESET STACK AFTER TRAP
060612  012637  000004          2$:     MOV     (SP)+,@#4       ;RESTORE LOCATION 4 FOR TESTING
060616  000137                  $DOAGN: JMP     @(PC)+          ;RETURN TO TEST
060620  001024                  $RTNAD: .WORD   RESTRT
060622     377     377     000  $ENULL: .BYTE   -1,-1,0          ;NULL CHARACTER STRING
060625     015  042412  042116  $ENDMG: .ASCIZ  <15><12>/END PASS #/
060632  050040  051501  020123
060640  000043
060642  005015  045103  042113  MSG1:   .ASCIZ  <15><12>/CJKDBD0 DCF11-AA CPU DIAGNOSTIC/
060650  042102  020060  041504
060656  030506  026461  040501
060664  041440  052520  042040
060672  040511  047107  051517
060700  044524  000103
                                        .EVEN
```

```
                                        .SBTTL  HALT ROUTINE

                                        ;*      HALT ROUTINE
                                        ;*      ------------
                                        ;*
                                        ;*
                                        ;*      PROGRAM COMES HERE ON ENCOUNTERING ANY ERROR
                                        ;*

060704  017637  000000  000302  $HLT:   MOV     @(SP),@#$FATAL  ;PLACE THE ERROR NUMBER AT LOCATION $FATAL
060712  011637  061072                  MOV     (SP),@#CONTIN   ;SAVE ERROR NUMBER ADDRESS
060716  032777  020000  146530          BIT     #20000,@SWR     ;HAS THE OPERATOR ASKED TO SUPRESS ERROR TYPE OUTS
060724  001021                          BNE     6$
060726  104401  042506                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060732  104401  061032                  TYPE    ,MSGERR         ;INFORM ERROR
060736  104401  042506                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060742  013746  061072                  MOV     @#CONTIN,-(SP)  ;RETREIVE ERROR NUMBER ADDR
060746  162716  000004                  SUB     #4,(SP)         ;CALCULATE ERROR PC
060752  104402                          TYPOC                   ;TYPE PC
060754  104401  042506                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060760  013746  000302                  MOV     @#$FATAL,-(SP)  ;RETREIVE ERROR NUMBER
060764  104403                          TYPOS                   ;TYPE ERROR NUMBER
060766     003                          .BYTE   3
060767     000                          .BYTE   0
060770  105767  117324          6$:     TSTB    $ENV            ;IF WE ARE NOT UNDER APT. THEN GO TO
060774  001403                          BEQ     8$              ;8$
060776  005237  000300                  INC     @#$MSGTY        ;OTHERWISE INFORM APT. ABOUT SEEING THE ERROR
061002  000777                          BR      .               ;AND LOOP
061004  104401  042506          8$:     TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
061010  005777  146440                  TST     @SWR    ;IS IT REQUIRED TO HALT ON ERROR ?
061014  100001                          BPL     10$             ;IF NOT THEN GO TO 10$
061016  000000                          HALT
061020  013746  061072          10$:    MOV     @#CONTIN,-(SP)  ;
061024  062716  000002                  ADD     #2,(SP)         ;CALCULATE RETURN ADDRESS
061030  000207                          RTS     PC              ;RETURN
061032  042440  051122  051117  MSGERR: .ASCIZ / ERROR!   PC, AND ERROR # ARE: /
061040  020041  020040  041520
061046  020054  047101  020104
061054  051105  047522  020122
061062  020043  051101  035105
061070  000040
                                        .EVEN
061072  000000                  CONTIN: .WORD 0

                                        .SBTTL  POWER FAIL ROUTINE
061074  012767  061104  116722  PWRDN:  MOV     #PWRUP,24
061102  000000                          HALT

061104  012767  061074  116712  PWRUP:  MOV     #PWRDN,24
061112  012706  001000                  MOV     #BUFF,SP
061116  132767  000040  117175          BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
061124  001013                          BNE     PFRES           ;NO
061126  012700  061160                  MOV     #MSGPWF,R0      ;GET MSG ADDR.
061132  105737  177564          PWAIT:  TSTB    @#TPS           ;TTY READY
061136  100375                          BPL     PWAIT           ;NO WAIT
061140  112037  177566                  MOVB    (R0)+,@#TPB     ;PRINT CHARACTER
```

```
061144  001372                          BNE     PWAIT           ;NEXT IF NOT DONE.
061146  105737  177564          PWAIT1: TSTB    @#TPS
061152  100375                          BPL     PWAIT1
061154  000167  117644          PFRES:  JMP     RESTRT
061160  005015  047520  042527  MSGPWF: .ASCIZ  <15><12>.POWER FAILED..
061166  020122  040506  046111
061174  042105  000041
                                .EVEN
                                .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
                                ;*

061200  105767  000337          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
061204  100002                          BPL     1$              ;;BR IF YES
061206  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
061210  000430                          BR      3$              ;;LEAVE
061212  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
061214  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
061220  122767  000001  117072          CMPB    #APTENV,$ENV    ;;RUNNING IN APT MODE
061226  001011                          BNE     62$             ;;NO,GO CHECK FOR APT CONSOLE
061230  132767  000100  117063          BITB    #APTSPOOL,$ENVM ;;SPOOL MESSAGE TO APT
061236  001405                          BEQ     62$             ;;NO,GO CHECK FOR CONSOLE
061240  010067  000004                  MOV     R0,61$          ;;SETUP MESSAGE ADDRESS FOR APT
061244  004767  000306                  JSR     PC,$ATY3        ;;SPOOL MESSAGE TO APT
061250  000000                  61$:    .WORD   0               ;;MESSAGE ADDRESS
061252  132767  000040  117041  62$:    BITB    #APTCSUP,$ENVM  ;;APT CONSOLE SUPPRESSED
061260  001003                          BNE     60$             ;;YES,SKIP TYPE OUT
061262  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
061264  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
061266  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
061270  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
061272  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
061276  000002                          RTI                     ;;RETURN
061300  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
061304  001430                          BEQ     8$
061306  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
061312  001006                          BNE     5$
061314  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
061316  104401                          TYPE                    ;;TYPE A CR AND LF
061320  042506                          $CRLF
061322  105067  000202                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
061326  000755                          BR      2$              ;;GET NEXT CHARACTER
061330  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
```

```
061334  126726  000202          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
061340  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
061342  016746  000172                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED.
                                                                ;;AND THE NULL CHAR.
061346  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
061352  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
061354  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
061360  105367  000144                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
061364  000770                          BR      7$              ;;LOOP

                                ;HORIZONTAL TAB PROCESSOR

061366  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
061372  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
061376  132767  000007  000124          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
061404  001372                          BNE     9$              ;;TAB STOP
061406  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
061410  000724                          BR      2$              ;;GET NEXT CHARACTER
061412                          $TYPEC:
061412  105777  000116                  TSTB    @$TKS           ;;CHAR IN KYBD BUFFER?                  ;MJD001
061416  100022                          BPL     10$             ;;BR IF NOT                             ;MJD001
061420  017746  000112                  MOV     @$TKB,-(SP)     ;;GET CHAR                              ;MJD001
061424  042716  177600                  BIC     #177600,(SP)    ;;STRIP EXTRANEOUS BITS                 ;MJD001
061430  122716  000023                  CMPB    #$XOFF,(SP)     ;;WAS CHAR XOFF                         ;MJD001
061434  001012                          BNE     102$            ;;BR IF NOT                             ;MJD001
061436                          101$:                                                                   ;MJD001
061436  105777  000072                  TSTB    @$TKS           ;;WAIT FOR CHAR                         ;MJD001
061442  100375                          BPL     101$                                                    ;MJD001
061444  117716  000066                  MOVB    @$TKB,(SP)      ;;GET CHAR                              ;MJD001
061450  042716  177600                  BIC     #177600,(SP)    ;;STRIP IT                              ;MJD001
061454  122716  000021                  CMPB    #$XON,(SP)      ;;WAS IT XON?                           ;MJD001
061460  001366                          BNE     101$            ;;BR IF NOT                             ;MJD001
061462                          102$:                                                                   ;MJD001
061462  005726                          TST     (SP)+           ;;FIX STACK                             ;MJD001
061464                          10$:                                                                    ;MJD001
061464  105777  161014                  TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
061470  100375                          BPL     10$                                                     ;MJD001
061472  116677  000002  161002          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
061500  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
061506  001003                          BNE     1$              ;;BRANCH IF NO
061510  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
061514  000406                          BR      $TYPEX          ;;EXIT
061516  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
061524  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
061526  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
061530  000000                  $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
061532  000207                  $TYPEX: RTS     PC

061534  177560                  $TKS:   .WORD   177560          ;;TTY KDB STATUS        ;MJD001
061536  177562                  $TKB:   .WORD   177562          ;;TTY KBD BUFFER        ;MJD001
061540     000                  $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
061541     002                  $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
061542     012                  $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
061543     000                  $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0-YES)
061544     077                  $QUES:  .ASCII  "?"             ;;QUESTION MARK
061545     012     000          $LF:    .ASCIZ  <12>            ;;LINEFEED
```

```
061550                                  .EVEN
                                .SBTTL  APT COMMUNICATIONS ROUTINE

                                ;*******************************************************************************
061550  112767  000001  000236  $ATY1:  MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
061556  112767  000001  000226  $ATY3:  MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
061564  000403                          BR      $ATYC
061566  112767  000001  000220  $ATY4:  MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL FRROR
061574                          $ATYC:
061574  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
061576  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
061600  105767  000206                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
061604  001450                          BEQ     5$              ;;IF NOT:  BR
061606  122767  000001  116504          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
061614  001031                          BNE     3$              ;;IF NOT:  BR
061616  132767  000100  116475          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
061624  001425                          BEQ     3$              ;;IF NOT:  BR
061626  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
061632  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
061640  005767  116434          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
061644  001375                          BNE     1$              ;;IF NOT:  WAIT
061646  010067  116442                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
061652  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
061654  001376                          BNE     2$
061656  166700  116432                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
061662  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
061664  010067  116426                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
061670  012767  000004  116402          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
061676  000413                          BR      5$
061700  017667  000004  000016  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
061706  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
061714  016746  116056                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
061720  004767  177254                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
061724  000000                  4$:     .WORD   0
061726                          5$:
061726  105767  000062          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
061732  001416                          BEQ     12$             ;;IF NOT:  BR
061734  005767  116360                  TST     $ENV            ;;RUNNING UNDER APT?
061740  001413                          BEQ     12$             ;;IF NOT:  BR
061742  005767  116332          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
061746  001375                          BNE     11$             ;;IF NOT:  WAIT
061750  017667  000004  116324          MOV     @4(SP),$FATAL   ;;GET ERROR #
061756  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
061764  005267  116310                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
061770  105067  000020          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
061774  105067  000013                  CLRB    $LFLG           ;;CLEAR LOG FLAG
062000  105067  000006                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
062004  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
062006  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
062010  000207                          RTS     PC              ;;RETURN
062012     000                  $MFLG:  .BYTE   0               ;;MESSG. FLAG
062013     000                  $LFLG:  .BYTE   0               ;;LOG FLAG
062014     000                  $FFLG:  .BYTE   0               ;;FATAL FLAG
        062016                          .EVEN
        000200                  APTSIZE=200
        000001                  APTENV=001
```

```
                000100                  APTSPOOL=100
                000040                  APTCSUP=040
                                        .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
                                        ;*******************************************************************************
                                        ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
                                        ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
                                        ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
                                        ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
                                        ;*REPLACED WITH SPACES.
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                                        ;*      TYPDS                   ;;GO TO THE ROUTINE

        062016                          $TYPDS:
        062016  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
        062020  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
        062022  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
        062024  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
        062026  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
        062030  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
        062034  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
        062040  100004                          BPL     1$              ;;BR IF INPUT IS POS.
        062042  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
        062044  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
        062052  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
        062054  012703  062232                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
        062060  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
        062064  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
        062066  016001  062222                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
        062072  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
        062074  002402                          BLT     4$              ;;BR IF DONE
        062076  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
        062100  000774                          BR      3$
        062102  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
        062104  005702                          TST     R2              ;;CHECK IF BCD DIGIT 0
        062106  001002                          BNE     5$              ;;FALL THROUGH IF 0
        062110  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
        062112  100407                          BMI     7$              ;;BR IF YES
        062114  106316                  5$:     ASLB    (SP)            ;;MSD?
        062116  103003                          BCC     6$              ;;BR IF NO
        062120  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
        062126  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
        062132  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
        062136  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
        062140  005720                          TST     (R0)+           ;;JUST INCREMENTING
        062142  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
        062146  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
        062150  003002                          BGT     8$              ;;GO TO EXIT
        062152  010502                          MOV     R5,R2           ;;GET THE LSD
        062154  000764                          BR      6$              ;;GO CHANGE TO ASCII
        062156  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
        062160  100003                          BPL     9$              ;;BR IF NO
        062162  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
        062170  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
        062172  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
```

```
062174  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
062176  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
062200  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
062202  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
062204  104401  062232                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
062210  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
062216  012616                          MOV     (SP)+,(SP)
062220  000002                          RTI                     ;;RETURN TO USER
062222  023420                  $DTBL:  10000.
062224  001750                          1000.
062226  000144                          100.
062230  000012                          10.
062232  000004                  $DBLK:  .BLKW   4
                                .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

062242  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
062246  116667  000001  000211          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
062254  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
062260  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
062264  000406                          BR      $TYPON
062266  112767  000001  000171  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
062274  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
062302  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
062310  010346                          MOV     R3,-(SP)        ;;SAVE R3
062312  010446                          MOV     R4,-(SP)        ;;SAVE R4
062314  010546                          MOV     R5,-(SP)        ;;SAVE R5
062316  116704  000145                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
062322  005404                          NEG     R4
062324  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
062330  110467  000132                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
062334  116704  000125                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
062340  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
062344  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
```

```
062346  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO ''C''
062350  000404                          BR      3$              ;;GO DO MSB
062352  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
062354  006105                          ROL     R5
062356  006105                          ROL     R5
062360  010503                          MOV     R5,R3
062362  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
062364  105367  000076                  DECB    $OMODE          ;;TYPE THIS DIGIT?
062370  100016                          BPL     7$              ;;BR IF NO
062372  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
062376  001002                          BNE     4$              ;;TEST FOR 0
062400  005704                          TST     R4              ;;SUPPRESS THIS 0?
062402  001403                          BEQ     5$              ;;BR IF YES
062404  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
062406  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
062412  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
062416  110367  000040                  MOVB    R3,8$           ;;SAVE FOR TYPING
062422  104401  062462                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
062426  105367  000032          7$:     DECB    $OCNT           ;;COUNT BY 1
062432  003347                          BGT     2$              ;;BR IF MORE TO DO
062434  002402                          BLT     6$              ;;BR IF DONE
062436  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
062440  000744                          BR      2$              ;;GO DO THE LAST DIGIT
062442  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
062444  012604                          MOV     (SP)+,R4        ;;RESTORE R4
062446  012603                          MOV     (SP)+,R3        ;;RESTORE R3
062450  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
062456  012616                          MOV     (SP)+,(SP)
062460  000002                          RTI                     ;;RETURN
062462     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
062463     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
062464     000                  $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
062465     000                  $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
062466  000000                  $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
                                .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.

062470  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
062472  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
062476  005740                          TST     -(R0)           ;;BACKUP BY 2
062500  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
062502  006300                          ASL     R0              ;;POSITION FOR INDEXING
062504  016000  062524                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
062510  000200                          RTS     R0              ;;GO TO ROUTINE


                                ;;THIS IS USE TO HANDLE THE ''GETPRI'' MACRO

062512  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
062514  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
062522  000002                          RTI                     ;;RESTORE THE PSW
```

```
                                        .SBTTL  TRAP TABLE

                                        ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                        ;*BY THE ''TRAP'' INSTRUCTION.

                                        ;       ROUTINE
                                        ;       -------
062524  062512                          $TRPAD: .WORD   $TRAP2
062526  061200                                  $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
062530  062266                                  $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
062532  062242                                  $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
062534  062302                                  $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
062536  062016                                  $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)

062540  177777                          PASSPT: -1
        000001                          .END
```

```
.          026100    8157#  8165*  8166   8169   8179   8198*  8199   8202   8212   8231*  8232*  8233*  8234
                     8237   8247   8257   8268   8285*  8286*  8287   8288*  8291   8301   8313   8323   8366
                     8368   8385*  8386   8388   8405*  8406*  8407   8424*  8425*  8426
ABASE  = 000000       344
ACDW1  = 000000       344
ACDW2  - 000000       344
ACPUOP= 000000        344    359
ADC1     020402      6387   6388   6394#
ADC2     020412      6389   6398#
ADC3     020432      6402   6403   6409#
ADC4     020442      6404   6413#
ADC5     020460      6416   6417   6418   6424#
ADDW0  - 000000       344
ADDW1  = 000000       344
ADDW10= 000000        344
ADDW11= 000000        344
ADDW12= 000000        344
ADDW13= 000000        344
ADDW14= 000000        344
ADDW15= C00000        344
ADDW2  = 000000       344
ADDW3  = 000000       344
ADDW4  = 000000       344
ADDW5  = 000000       344
ADDW6  = 000000       344
ADDW7  - 000000       344
ADDW8  = 000000       344
ADDW9  - 000000       344
ADD1     020216      6309   6310   6316#
ADD2     020226      6311   6320#
ADD3     020242      6323   6324   6330#
ADD4     020252      6325   6334#
ADD5     020270      6337   6338   6344#
ADD6     020300      6339   6348#
ADD7     020312      6349   6350   6356#
ADD8     020322      6351   6360#
ADD9     020342      6363   6364   6365   6371#
ADEVCT= 000000        344    350
ADEVM  = 000000       344
AENV   = 000000       344    355
AENVM    000000       344    356
AFATAL= 000000        344    347
AMADR1- 000000        344
AMADR2= 000000        344
AMADR3- 000000        344
AMADR4- 000000        344
AMAMS1- 000000        344
AMAMS2   000000       344
AMAMS3= 000000        344
AMAMS4= 000000        344
AMSGAD= 000000        344    352
AMSGLG= 000000        344    353
AMSGTY= 000000        344    346
AMTYP1= 000000        344
AMTYP2= 000000        344
AMTYP3- 000000        344
```

```
AMTYP4- 000000      344
APASS - 000000      344    349
APRIOR= 000000      344
APTCSJ= 000040    15463  15594#
APTENV= 000001    10967  10998  11031  11066  11093  11120  11165  15456  15550  15592#
APTSIZ= 000200    15591#
APTSPO= 000100    15458  15552  15593#
AROUN   025300     7952   7955#
AROUND  042040    11408  11424#
ASL1    021716     6889   6890   6891   6897#
ASL2    021726     6892   6901#
ASL3    021744     6904   6905   6906   6912#
ASL4    021754     6907   6916#
ASL5    021770     6919   6920   6926#
ASL6    022000     6921   6930#
ASL7    022024     6933   6934   6935   6936   6943#
ASR1    022066     6958   6959   6960   6966#
ASR2    022076     6961   6970#
ASR3    022120     6974   6975   6976   6982#
ASR4    022130     6977   6986#
ASR5    022144     6989   6990   6991   6997#
ASR6    022154     6992   7001#
ASR7    022204     7005   7006   7007   7008   7015#
ASTART  042610    11645#  11879  11883
ASWREG= 000000      344    357
ATESTN= 000000      344    348
ATRAP   037570    10865  10898#
AUNIT = 000000      344    351
AUSWR = 000000      344    358
AUTO1   037676    10940#
AVECT1= 000000      344
AVECT2= 000000      344
BELL    000240     8618#
BIC1    017346     5986   5987   5993#
BIC2    017356     5988   5997#
BIC3    017374     6000   6001   6007#
BIS1    017436     6022   6023   6024   6030#
BIS2    017446     6025   6034#
BIS3    017466     6037   6038   6039   6045#
BITCHK  025466     8007#
BITCLR  025416     7994#
BITCON  025550     8020   8029#
BITSET  025432     8000#
BIT1    017256     5949   5950   5956#
BIT2    017266     5951   5961#
BIT3    017304     5964   5965   5971#
BRA1    001074      456    462#
BRA2    001104      457    466#
BRA3    001116      467    475#
BRA4    001124      476    482#
BRA5    001134      477    486#
BRCT    025336     7939*  7969#  7975*
BRC1    003350     1340   1346#
BRC2    003360     1341   1351#
BRC3    003370     1353   1359#
BRH     025310     7940*  7960#
```

BRMFPD	027120	8473	8477#											
BRN1	003230	1256	1262#											
BRN2	003240	1257	1267#											
BRN3	003250	1269	1275#											
BRTAB	027214	7937	8503#											
BRV1	003300	1298	1304#											
BRV2	003310	1299	1309#											
BRV3	003320	1311	1317#											
BRZ1	003160	1209	1215#											
BRZ2	003170	1210	1220#											
BRZ3	003200	1222	1228#											
BR1	027552	8664	8673#											
BR10	027766	8752	8761#											
BR11	030072	8785	8794#											
BR12	030140	8800	8809#											
BR13	030206	8815	8824#											
BR14	030254	8830	8839#											
BR15	030352	8861	8870#											
BR16	030372	8871	8880#											
BR17	030412	8881	8890#											
BR2	027600	8676	8685#											
BR20	030432	8891	8899#											
BR21	030452	8900	8909#											
BR22	030472	8910	8919#											
BR23	030512	8920	8929#											
BR3	027622	8688	8697#											
BR33	030562	8949	8957#											
BR34	030574	8958	8966#											
BR35	030606	8967	8975#											
BR36	030620	8976	8984#											
BR37	030642	8987	8995#											
BR4	027646	8701	8710#											
BR40	030654	8996	9004#											
BR41	030666	9005	9013#											
BR45	032214	9418	9424#											
BR46	032762	9524	9622#											
BR46A	032772	9617	9626#											
BR47	033552	9825	9831#											
BR5	027672	8714	8723#											
BR51	034320	9933	10031#											
BR51A	034330	10026	10035#											
BR6	027716	8727	8735#											
BR7	027742	8739	8748#											
BR70	037306	10798	10813#											
BR71	040236	10995	11007	11016#										
BTCON	025624	8047	8052#											
BTERR	025610	8042	8048#											
BTRAP	037644	10906	10924#											
BUFF =	001000	8626#	9029	9043	9046	9062	9065	9081	9086	9095	9100	9116	9165	9227
		9240	9243	9259	9262	9278	9283	9292	9296	9312	9361	9422	9439	9452
		9455	9471	9474	9490	9495	9504	9509	9525	9574	9634	9647	9650	9666
		9669	9685	9690	9699	9704	9720	9769	9829	9847	9860	9863	9879	9882
		9898	9903	9913	9918	9934	9983	10050	10063	10066	10082	10085	10101	10106
		10115	10120	10136	10185	10242	10255	10258	10274	10277	10294	10299	10308	10313
		10329	10378	10650	10666	10675	10691	10697	10716	10741	10771	10800	10825	10831
		10866	10888	10907	10934	10950	11003	11036	11097	11126	11141	11171	11195	11216

		11222 11449 11456 11461 11466 15418
CC	- 177776	8625# 9083* 9097* 9156 9205 9280* 9294* 9352 9401 9492* 9506* 9565 9614
		9687* 9701* 9760 9810 9900* 9915* 9974 10023 10103* 10117* 10176 10225 10296*
		10310* 10369 10418 11450*
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CC1	025304	7942* 7944* 7958#
CC2	025746	8103* 8111# 8120* 8126*
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CON1	025762	8112 8120#
CON2	026054	8134 8143#
CORH	037630	10899* 10912#
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IJMP5     016324        5661    5664#
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ILLB    = 000100        8624#  10608
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INC2      017536        6074    6083#
INC3      017560        6087    6088    6089    6095#
INC4      017570        6090    6100#
INC5      017604        6103    6104    6110#
INST      042414       11446*  11447*  11451   11461   11476   1521#
INSTC     031020        9064#
INSTK     035176       10276#  10277
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K11      027450    8643#
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K2       027432    8636#
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K5       027440    8639#  8779*  8782   8794*  8810*  8812   8814   8825*  3827   8829   8840*  8842
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MDM2C    012466    4296#
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NEG11	004444	1858	1868#											
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NEG13	004476	1879	1880	1881	1887#									
NEG14	004506	1882	1891#											
NEG2	020532	6453	6462#											
NEG20	004554	1911	1912	1913	1919#									
NEG21	004564	1914	1923#											
NEG22	004612	1929	1937#											
NEG3	020554	6466	6467	6468	6474#									
NEG30	005134	2115	2116	2117	2123#									
NEG31	005144	2118	2127#											
NEG32	005160	2128	2136#											
NEG33	005204	2139	2147#											
NEG34	005220	2148	2156#											
NEG4	020564	6469	6478#											
NEG40	005612	2359	2360	2361	2367#									
NEG41	005622	2362	2371#											
NEG42	005636	2372	2380#											
NEG5	020604	6482	6483	6484	6490#									
NEG50	005712	2404	2405	2406	2412#									
NEG51	005722	2407	2416#											
NEG52	005736	2417	2425#											
NEG60	006014	2449	2450	2451	2457#									
NEG61	006024	2452	2461#											
NEG70	006074	2482	2483	2484	2490#									
NEG71	006104	2485	2494#											
NODL	040260	10997	11001	11022#										
NODL1	040444	11030	11034	11056#										
NODL2	040544	11065	11069	11086#										
NODL3	041034	11119	11123	11157#										
NOP	000240	320	8619#											
NOR	037474	10867#	10870											
NOSUB	037612	10903	10906#											
PASSPT	062540	443*	15777#											

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PCN01   026542    8348#  8349
PCN1    041242   11218#  11222
PCN2    026576    8367#  8368
PCN3    026644    8387#  8388
PCN4    026706    8406#  8407
PCN5    026746    8425#  8426
PFRES   061154   15420   15428#
POWER   042514   11607#
PROFTE  037744   10949*  10954#  10955*  10965   10996   11029   11064   11118
PS    = 177776     323#   1055*   1120*   1121    1138*   1139    1156*   1157    1174*   1175    7232#   7251    7286*
                  7288    7317*   7319    7347*   7349    7379    7407*   7409    7437*   7439    7473*   7487*   7508*
                  7550*   7592*   7634*   7676*   7718*   7766*   7768    7791*   7792*   7798*   7802*   7818*   7819*
                  7823*   7827*   7838*   7840*   7846*   7861*   7864    7866*   7870*   7884*   7886*   7890    7892*
                  7896*   8043*   8044*   8045    8048*   8052*   8108    8130    8468*   8471*   8485*   8491*
PSWORD  042430   11577#  11578   11654*  11655   11693*  11694   11731*  11732   11769*  11770   11808*  11809   11848*
                 11849   11961*  11962   11990*  11991   12019*  12020   12048*  12049   12077*  12078   12106*  12107
                 12135*  12136   12164*  12165   12193*  12194   12222*  12223   12275*  12276   12328*  12329   12381*
                 12382   12537*  12538   12571*  12572   12606*  12607   12641*  12642   12675*  12676   12710*  12711
                 12745*  12746   12779*  12780   12825*  12826   12862*  12863   12899*  12900   12936*  12937   12973*
                 12974   13010*  13011   13047*  13048   13084*  13085   13121*  13122   13158*  13159   13207*  13208
                 13242*  13243   13277*  13278   13313*  13314   13349*  13350   13384*  13385   13420*  13421   13456*
                 13457   13491*  13492   13526*  13527   13562*  13563   13598*  13599   13633*  13634   13668*  13669
                 13704*  13705   13740*  13741   13775*  13776   13811*  13812   13851*  13852   13886*  13887   13921*
                 13922   13956*  13957   13991*  13992   14026*  14027   14061*  14062   14096*  14097   14131*  14132
                 14166*  14167   14208*  14210   14250*  14252   14293*  14295   14336*  14338   14378*  14380   14421*
                 14423   14464*  14466   14506*  14508   14548*  14550   14591*  14593   14634*  14636   14676*  14678
                 14719*  14721   14762*  14764   14804*  14806   14847*  14848*  14850   14876*  14877*  14879   14908*
                 14910   14950*  14952   14992*  14994   15034*  15036   15076*  15078   15118*  15120   15160*  15162
                 15202*  15204   15244*  15246   15286*  15288
PUSRM = 030000     329#
PWAIT   061132   15422#  15423   15425
PWAIT1  061146   15426#  15427
PWRDN   061074     441   15414#  15417
PWRUP   061104   15414   15417#
RA      033562    9828    9835#
RA1     032224    9421    9428#
RB      033550    9827*   9830#   9835*   9836
RB1     032212    9420*   9423#   9428*   9429
RC      033544    9829#   9837
RC1     032206    9422#   9430
REGR1   042756   11682   11685#
REGR2   043124   11720   11723#
REGR23  045634   12315   12318#
REGR3   043272   11758   11761#
REGR4   043436   11796   11799#
REGR5   043606   11836   11839#
REG01   045434   12265#  12424
REG1    002032     816#    819
REG1A   002076     840#    843
REG1E   002044     817     825#
REG2    002146     864#    867
REG2A   002174     860     865     863     877#
REG2B   002222     888#    891
REG2C   002254     893     899#
REG3    002302     910#    913
REG3A   002346     934#    937
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REG3E	002314	911	919#	
REG4	002416	959#	962	
REG4A	002462	983#	986	
REG4E	002430	960	968#	
REG45	046034	12367	12370#	
REG5	002532	1009#	1012	
REG5A	002576	1033#	1036	
REG5E	002544	1010	1018#	
REG6	002654	1059#	1062	
REG6A	002720	1083#	1086	
REG6E	002666	1060	1068#	
RESET2	040632	11098	11108#	
RESET3	040622	11092	11104#	
REST	024472	7778#		
RESTRT	001024	444#	15357	15428
RET	042204	11448	11456#	
RETA	030724	9028	9032#	
RETAH	030734	9030	9036#	
RETAT	036624	10651	10659#	
RETA1	031500	9228	9233#	
RETA2	032306	9440	9445#	
RETA3	033040	9635	9640#	
RETA4	033644	9848	9853#	
RETA5	034376	10051	10056#	
RETB	030760	9044	9046#	
RETBT	036672	10667	10675#	
RETB1	031524	9241	9243#	
RETB2	032332	9453	9455#	
RETB3	033064	9648	9650#	
RETB4	033670	9861	9863#	
RETB5	034422	10064	10066#	
RETC	031022	9063	9065#	
RETCT	036744	10692	10697#	
RETC1	031566	9260	9262#	
RETC2	032374	9472	9474#	
RETC3	033126	9667	9669#	
RETC4	033732	9880	9882#	
RETC5	034464	10083	10085#	
RETD	031074	9082	9086#	
RETD1	031640	9279	9283#	
RETD2	032446	9491	9495#	
RETD3	033200	9686	9690#	
RETD4	034004	9899	9903#	
RETD5	034536	10102	10106#	
RETE	031140	9096	9100#	
RETE1	031702	9293	9296#	
RETE2	032512	9505	9509#	
RETE3	033244	9700	9704#	
RETE4	034050	9914	9918#	
RETE5	034602	10116	10120#	
RETF	031210	9117	9120#	
RETF1	031752	9313	9316#	
RETF2	032562	9526	9529#	
RETF3	033314	9721	9724#	
RETF4	034120	9935	9938#	
RETF5	034652	10137	10140#	

RETG	031322	9166	9169#								
RETG1	032064	9362	9365#								
RETG2	032674	9575	9578#								
RETG3	033426	9770	9773#								
RETG4	034232	9984	9987#								
RETG5	034764	10186	10189#								
RETH5	035112	10243	10248#								
RETJ	035136	10256	10258#								
RETK	035200	10275	10277#								
RETL	035252	10295	10299#								
RETM	035316	10309	10313#								
RETN	035366	10330	10333#								
RETO	035476	10379	10382#								
RETR1	041256	11217	11222#								
RETR2	041334	11243	11252#								
RETR3	041402	11269	11275#								
RET1	042222	11457	11461#								
RET2	042242	11462	11466#								
RET3	042260	11467	11476#								
RET4	042250	11402	11472#								
RITSH	046244	12316	12368	12422	12425#						
ROL1	021406	6754	6755	6756	6762#						
ROL2	021416	6757	6766#								
ROL3	021434	6769	6770	6771	6777#						
ROL4	021444	6772	6781#								
ROL5	021460	6784	6785	6791#							
ROL6	021470	6786	6795#								
ROL7	021512	6798	6799	6800	6807#						
ROR1	021554	6822	6823	6824	6830#						
ROR2	021564	6825	6834#								
ROR3	021602	6837	6838	6839	6845#						
ROR4	021612	6840	6849#								
ROR5	021630	6852	6853	6854	6860#						
ROR6	021640	6855	6864#								
ROR7	021654	6867	6868	6874#							
ROTX	015172	5189	5191*	5195	5208#	5223*	5225*	5227	5252*	5253	5257
ROTXAD	015316	5253*	5255*	5268#							
ROT0A	014310	4920	4921	4928#							
ROT0B	014320	4923	4932#								
ROT0C	014342	4935	4936	4943#							
ROT1A	014410	4968	4969	4976#							
ROT1B	014420	4971	4980#								
ROT1C	014444	4983	4984	4991#							
ROT1D	014454	4986	4995#								
ROT1E	014504	5000	5001	5008#							
ROT2A	014556	5031	5033	5041#							
ROT2B	014566	5036	5045#								
ROT2C	014616	5049	5051	5058#							
ROT2D	014626	5053	5062#								
ROT2E	014662	5067	5069	5077#							
ROT3A	014730	5099	5106#								
ROT3B	014740	5101	5110#								
ROT3C	014766	5113	5120#								
ROT3D	014776	5115	5124#								
ROT3E	015024	5127	5134#								
ROT4	015100	5158	5160	5167#							

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ROT5      015162     5188   5194   5196   5203#
ROT6      015232     5226   5233#
ROT7      015306     5251   5256   5263#
RTI1      037174    10773  10777#
RTI2      037206    10774  10781#
RTRAP  =  000010     8622#  9030*  9044*  9063*  9082*  9096*  9117*  9118*  9166*  9167*  11302* 11341*
RTRAP1=   000034     8613#  9228*  9241*  9260*  9279*  9293*  9313*  9314*  9362*  9363*
RTRAP2=   000020     8612#  9440*  9453*  9472*  9491*  9505*  9526*  9527*  9575*  9576*
RTRAP3=   000030     8611#  9635*  9648*  9667*  9686*  9700*  9721*  9722*  9770*  9771*
RTRAP4=   000014     8610#  9848*  9861*  9880*  9899*  9914*  9935*  9936*  9984*  9985*  10651* 10667* 10692*
RTRAP5=   000004     8609# 10051* 10064* 10083* 10102* 10116* 10137* 10138* 10186* 10187* 10243* 10256* 10275*
                    10295* 10309* 10330* 10331* 10379* 10380* 11217* 11243* 11269* 11300* 11340*
RTS1      017122     5872   5879#
RTT1      037022    10719  10722#
RTT2      037036    10720  10733#
RTT3      037100    10743  10747#
RTT4      037116    10744  10753#
RTT5      037052    10741# 10749  10756
RTT6      037136    10754  10764#
ROTRAP    037526    10871  10878#
R1ERR     002114      841    850#
R2ERR     002244      889    895#
R3ERR     002364      935    944#
R4ERR     002500      984    993#
R5ERR     002614     1034   1043#
R6ERR     002736     1084   1093#
R7TRX     040114    10966  10970  10989#
SBC1      021240     6675   6676   6677   6683#
SBC2      021250     6678   6687#
SBC3      021266     6690   6691   6692   6698#
SBC4      021276     6693   6702#
SBC5      021314     6705   6706   6707   6713#
SBC6      021324     6708   6717#
SBC7      021344     6721   6722   6728#
SB0       015350     5286   5294#
SB2       015472     5350   5358#
SB4       015616     5414   5422#
SB5       015704     5448   5467#
SB5A      015676     5453   5461#
SB5X      015714     5450*  5452   5472#  5473
SB5XAD    015716     5449   5461   5473#
SB6       015756     5490   5500#
SB6X      015766     5491*  5492   5505#
SB7       016026     5523   5533#
SB7X      016036     5524*  5538#  5539
SB7XAD    016040     5525   5539#
SCOPE  =  000240      320#
SC3       026024     8104*  8129#  8144*  8145
SC4       026040     8105*  8133#  8143*
SECPRT    027424     8493   8580#
SETBR     025174     7940#  7979
SETCC     025214     7944#  7974
SETCD     026022     8125   8128#  8146
SETUP     025156     7937#
SET2BR    025264     7949   7953#
SHL       001502      655#   658
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SHLE	001516	656	664#		
SHR	001616	699#	702		
SHRE	001632	700	708#		
SKPMSG	060500	15329	15331#		
SKP104	037760	10958#			
SKTST2	040650	11096	11111#		
SNMB0A	006300	2599	2600	2606#	
SNMB1A	006404	2664	2665	2671#	
SNMB1B	006414	2666	2675#		
SNMB1C	006436	2680	2681	2682	2688#
SNMB2A	006560	2756	2757	2763#	
SNMB2B	006570	2758	2767#		
SNMB2C	006604	2768	2776#		
SNMB2D	006624	2780	2781	2782	2788#
SNMB2E	006634	2783	2792#		
SNMB3A	006776	2872	2873	2879#	
SNMB3B	007006	2874	2883#		
SNMB3C	007024	2886	2887	2888	2894#
SNMB3D	007034	2889	2898#		
SNM0A	006240	2566	2567	2568	2574#
SNM1A	006342	2631	2632	2633	2639#
SNM2A	006500	2712	2713	2714	2720#
SNM2B	006510	2715	2724#		
SNM3A	006710	2824	2825	2826	2832#
SNM3B	006720	2827	2836#		
SNM4A	007104	2929	2930	2936#	
SNM4B	007114	2931	2940#		
SNM5A	007166	2972	2973	2979#	
SNM5B	007176	2974	2983#		
SNM6A	007252	3015	3016	3022#	
SNM6B	007262	3017	3026#		
SNM7A	007334	3057	3058	3064#	
SNM7B	007344	3059	3068#		
SOB1	022454	7144#	7157		
SOB2	022462	7144	7145	7151#	
SOB3	022472	7146	7155#		
SOB4	022512	7158	7159	7160	7167#
SOPA	006156	2524	2532#		
SOPB	006176	2521	2534	2541#	
SOPB0A	003566	1492	1500#		
SOPB0B	003576	1501	1508#		
SOPB1A	003710	1570	1578#		
SOPB1B	003726	1579	1582	1589#	
SOPB1C	003772	1616	1624#		
SOPB1D	004012	1629	1636#		
SOPB2A	004146	1712	1720#		
SOPB2B	004166	1724	1732#		
SOPB2C	004236	1756	1764#		
SOPB2D	004262	1770	1778#		
SOPB3A	004750	2022	2030#		
SOPB3B	004774	2033	2035	2044#	
SOPB3C	005042	2075	2083#		
SOPB3D	005064	2089	2096#		
SOPX	006142	2523#	2532*	2533*	2546
SOPXAD	006206	2535*	2546#		
SOPZA	004060	1664	1672#		

SOP0A	003424	1403	1411#											
SOP0B	003444	1414	1422#											
SOP0C	003506	1451	1459#											
SOP0D	003532	1461	1464	1473#										
SOP1A	003634	1530	1538#											
SOP1B	003646	1539	1547#											
SOP2B	004100	1675	1684#											
SOP3A	004664	1973	1981#											
SOP3B	004700	1984	1991#											
SOP4A	005276	2187	2195#											
SOP4B	005316	2198	2207#											
SOP5A	005374	2243	2251#											
SOP5B	005410	2254	2261#											
SOP6A	005454	2285	2293#											
SOP6B	005470	2294	2301#											
SOP7A	005536	2327	2335#											
SOP7B	005552	2336	2343#											
START	001002	433	441#											
STATUS=	177776	8620#	8948*	8985*	10878*	10879	10924*	10925	10973*	10978*	11004*	11010*	11037*	11108*
		11128*	11131	11144*	11146	11181*	11186							
STBOT	001000	430#	434	444	1119	5717	5734	5755	5767	5870	7185	7200	7219	7845
		7847	7860	7871	7888	7897	8626	11342	11355	11388	11395	11622		
STP	036544	10633	10642#											
STPP	031410	9115	9213#											
STPPA	031420	9208	9217#											
STP3	037402	10824	10837#											
STP3D	037412	10832	10841#											
STP4	041210	11164	11201#											
STP4E	041220	11168	11196	11205#										
SUB0	007500	3145	3146	3147	3153#									
SUB0A	007510	3148	3157#											
SUB1	021066	6608	6609	6615#										
SUB2	021076	6610	6619#											
SUB3	021120	6623	6624	6630#										
SUB4	021130	6625	6634#											
SUB5	021146	6638	6639	6645#										
SUB6	021156	6640	6649#											
SUB7	021176	6652	6653	6654	6660#									
SWB1	020130	6263	6264	6270#										
SWB2	020140	6265	6274#											
SWB3	020156	6277	6278	6279	6285#									
SWR	027454	8645#	8647*	8650*	8651	10860	11415*	11432*	11440	15380	15398			
SWREG	000176	416#												
SW09	- 001000	11570#												
SW10	= 002000	11571#												
SW11	= 004000	11572#												
SW12	= 010000	11573#												
SXT0	022252	7041	7042	7043	7044	7051#								
SXT1	022262	7046	7055#											
SXT2	022312	7061	7062	7063	7064	7071#								
S0	042450	11591#												
S1	042452	11592#	11593	11952	12018	12813	12824	12898						
S10	042474	11601#	14898	14949										
S11	042476	11602#												
S2	042454	11593#	11953	11989	12814	12861								
S3	042456	11594#												

S4	042460	11595#												
S5	042462	11596#	11597	13841	13850	13920								
S6	042464	11597#	13842	13885										
S7	042466	11598#												
S8	042470	11599#												
S9	042472	11600#	11601	14897	14907	14991								
TABLE	042272	11435	11480#											
TBL1	014020	4782	4783*	4784*	4785*	4786*	4787	4803#	4821*	4822*	4823*	4824*	4825	4836
		4837	4838	4839	4840	4857	4858*	4859*	4860*	4861*	4862	4889*	4890*	4891*
		4892*	4893											
TBL2	014104	4820	4840#	4888										
TDEC1	035624	10437	10442#											
TDEC2	035650	10451	10453#											
TDEC3	035716	10472	10474#											
TDEC4	035764	10485	10490#											
TDEC6	036000	10493#												
TDEC7	036010	10491	10497#											
TDEC77	040076	10975	10986#											
TDEC8	040066	10964	10976	10982#										
TEMP1	042432	11579#	11580	11623*	11646	11686	11724	11762	11800	11841	11880*	11886*	11901*	11908*
		11926*	11939*	12258*	12266	12319	12372	12426*	12434*	12448*	12456*	12463*	12468*	12474*
		12505*	12512*											
TEMP2	042434	11581#	11582	11624*	11649	11653	11679*	11689	11692	11717*	11727	11730	11755*	11765
		11768	11793*	11804	11807	11833*	11844	11847	11873*	11881*	11887*	11893*	11897*	11902*
		11909*	11914*	11920*	11927*	11933*	12259*	12267	12320	12373	12427*	12475*	12482*	12493*
		12498*	12506*	12513*										
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VDEC8    036232          10549   10551   10554#
VDEC9    036312          10567   10573#
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WATE1    041106          11174#  11175
WATE2    041122          11177#  11178
WATE3    041150          11182#  11195
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XOR2     022376           7100    7109#
XOR3     022424           7113    7114    7115    7116    7123#
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. ABS. 062542 000

ERRORS DETECTED: 0

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RUN-TIME: 136 173 18 SECONDS
RUN-TIME RATIO: 437/329=1.3
CORE USED: 25K (49 PAGES)