PDP11/23

DCF11-AA DIAG

CJKDBB0

AH-F140B-MC

FICHE 1 OF 2

SEP 1979

digital

MADE IN USA

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000000                          .REPT 0
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IDENTIFICATION

PRODUCT CODE: AC-F141B-MC

PRODUCT NAME: CJKDBB0 DCF11-AA CPU DIAG

DATE: JUN-79

MAINTAINER: DIAGNOSTIC ENGINEERING

CONTENTS

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 CONTAIN 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 (APPLICABLE ONLY TO PART THREE).
          ----------------

               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.

               BIT #   OCTAL VALUE              FUNCTION

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

               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
          ------------------
```

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                                        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
```

```
                                 ;PROGRAMMER: KIN C. LEE

                                         .TITLE  CJKDB-B  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  060472                   $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   000010               $TSTM:  .WORD   10        ;;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   027300                       T04
        000006   000000                       0
        000010   027310                       T010
        000012   000000                       0
        000014   027320                       T014
                 000030                       .=30
        000030   027330                       T030
        000032   000000                       0
        000034   027340                       T034
        000036   000000                       0
                 000114                       .=114
        000114   027350                       T0114
        000116   000000                       0
                 000244                       .=244
        000244   027360                       T0244
        000246   000000                       0
        000250   027370                       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  060716  000024  START:  MOV     #PWRDN,@#24                     ;SET UP FOR POWER FAIL
001010  012737  000000  000306          MOV     #0,@#$PASS              ;CLEAR PASS COUNT
001016  012737  000016  062304          MOV     #16.,@#PASSPT           ;SET PRINT COUNTER
001024  012706  001000          RESTRT: MOV     #STBOT,R6               ;INITIALIZE STACK POINTER
001030  012702  000304                  MOV     #$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 PAD 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
```

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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
```

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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 BRANCH 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   <====
```

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                                                                      ;               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
                                    ;*******************************************************************************
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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 C;EAR
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)       ;MOVE 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  001012                        BNE     TS32-10         ;BR TO ERROR HALT ON SEQ ERROR
002634  012706  000001                MOV     #1,R6           ;SET BIT 0
002640  012700  177757                MOV     #-21,R0         ;SET BIT COUNTER
002644  000241                        CLC                     ;CLEAR C-BIT
002646  005200                 REG6:  INC     R0              ;INCREMENT BIT COUNTER
002650  001403                        BEQ     REG6E           ;BR TO ERROR HALT IF BIT IS LOST
002652  006106                        ROL     R6              ;ROTATE 1 POSITION
002654  103374                        BCC     REG6            ;ALL DONE
002656  001404                        BEQ     TS32
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                              ;           WHICH FOLLOWS W/ 765            <====
002660                         REG6E:
002660  012742  000035                MOV     #35,-(R2)       ;MOVE TO MAILBOX #  *******  35  *******
002664  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002666  000000                        HALT                    ;FAILURE WITH R6
                                                              ;  OR SEQUENCE ERROR

                               ;*******************************************************************************
                               ;TEST 32         TEST IF R6 CAN HOLD A ZERO IN ALL BITS
                               ;*******************************************************************************
002670  005212                 TS32:  INC     (R2)            ;UPDATE TEST NUMBER
002672  022712  000032                CMP     #32,(R2)        ;SEQUENCE ERROR?
002676  001014                        BNE     TS33-10         ;BR TO ERROR HALT ON SEQ ERROR
002700  012706  177776                MOV     #-2,R6          ;SET ALL ONES IN R6 EXCEPT FOR BIT 0
002704  012700  177757                MOV     #-21,R0         ;SET BIT COUNTER
002710  000261                        SEC                     ;SET C-BIT
002712  005200                 REG6A: INC     R0              ;INCREMENT BIT COUNT
002714  001405                        BEQ     R6ERR           ;BR TO ERROR HALT IF COUNTER=0
002716  006106                        ROL     R6              ;ROTATE 1 POSITION
002720  103774                        BCS     REG6A           ;CONTINUE UNTIL C-BIT IS CLEAR
002722  022706  177777                CMP     #-1,R6          ;CHECK DATA
002726  001404                        BEQ     TS33
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                              ;           WHICH FOLLOWS W/ 763            <====
002730                         R6ERR:
002730  012742  000036                MOV     #36,-(R2)       ;MOVE TO MAILBOX #  *******  36  *******
002734  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002736  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
                                        ;*******************************************************************************
 002740 005212                          TS33:   INC     (R2)            ;UPDATE TEST NUMBER
 002742 022712 000033                           CMP     #33,(R2)        ;SEQUENCE ERROR?
 002746 001010                                  BNE     TS34-10         ;BR TO ERROR HALT ON SEQ ERROR
 002750 012706 001000                           MOV     #STBOT,R6
 002754 012737 000000 177776                    MOV     #0,@#PS         ;SET PSW TO ZERO
 002762 005737 177776                           TST     @#PS            ;SUCCESSFUL
 002766 001404                                  BEQ     TS34
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 767            <====
 002770 012742 000037                           MOV     #37,-(R2)       ;MOVE TO MAILBOX #  *******  37  *******
 002774 005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 002776 000000                                  HALT                    ;PSW NOT 0
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 34        TEST IF PSW WILL HOLD ONES AND ZEROES
                                        ;*******************************************************************************
 003000 005212                          TS34:   INC     (R2)            ;UPDATE TEST NUMBER
 003002 022712 000034                           CMP     #34,(R2)        ;SEQUENCE ERROR?
 003006 001007                                  BNE     TS35-10         ;BR TO ERROR HALT ON SEQ ERROR
 003010 012737 000252 177776                    MOV     #252,@#PS       ;MOVE ALT. ONES AND ZEROES TO PSW
 003016 023727 177776 000252                    CMP     @#PS,#252       ;SUCCESSFUL?
 003024 001404                                  BEQ     TS35
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 770            <====
 003026 012742 000040                           MOV     #40,-(R2)       ;MOVE TO MAILBOX #  *******  40  *******
 003032 005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 003034 000000                                  HALT                    ;PSW NOT 252
                                                                        ;  OR SEQUENCE ERROR

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

```
003036  005212                          TS35:   INC     (R2)            ;UPDATE TEST NUMBER
003040  022712  000035                          CMP     #35,(R2)        ;SEQUENCE ERROR?
003044  001007                                  BNE     TS36-10         ;BR TO ERROR HALT ON SEQ ERROR
003046  012737  000105  177776                  MOV     #105,@#PS       ;MOVE ALT. ONES AND ZEROES TO PSW
003054  023727  177776  000105                  CMP     @#PS,#105       ;SUCCESSFUL?
003062  001404                                  BEQ     TS36
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 770             <====
003064  012742  000041                          MOV     #41,-(R2)       ;MOVE TO MAILBOX #  *******  41  *******
003070  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003072  000000                                  HALT                    ;PSW NOT 105
                                                                        ;  OR SEQUENCE ERROR

                                        ;*************************************************************************
                                        ;TEST 36         TEST IF PSW (EXCEPT T-BIT) WILL HOLD ALL ONES
                                        ;*************************************************************************
003074  005212                          TS36:   INC     (R2)            ;UPDATE TEST NUMBER
003076  022712  000036                          CMP     #36,(R2)        ;SEQUENCE ERROR?
003102  001007                                  BNE     TS37-10         ;BR TO ERROR HALT ON SEQ ERROR
003104  012737  000357  177776                  MOV     #357,@#PS       ;MOVE ONES TO PSW
003112  023727  177776  000357                  CMP     @#PS,#357       ;SUCCESSFUL
003120  001404                                  BEQ     TS37
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 770             <====
003122  012742  000042                          MOV     #42,-(R2)       ;MOVE TO MAILBOX #  *******  42  *******
003126  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003130  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
                                        ;*************************************************************************
003132  005212                          TS37:   INC     (R2)            ;UPDATE TEST NUMBER
003134  022712  000037                          CMP     #37,(R2)        ;SEQUENCE ERROR?
003140  001014                                  BNE     TS40-10         ;BR TO ERROR HALT ON SEQ ERROR
                                                ;FIRST WITH Z-BIT ON
003142  000257                                  CCC                     ;CC=0100: JUST Z-BIT
003144  000264                                  SEZ
```

```
003146  001001                      BNE     BRZ1            ;CHECK OPPOSITE CONDITION
003150  001404                      BEQ     BRZ2
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 773            <====
003152                      BRZ1:
003152  012742  000043              MOV     #43,-(R2)       ;MOVE TO MAILBOX #  *******  43  *******
003156  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003160  000000                      HALT                    ;IMPROPER BR W/ Z=1
                                    ;CHECK WITH Z-BIT OFF
003162  000277              BRZ2:   SCC                     ;CC=1011: ALL BUT Z-BIT
003164  000244                      CLZ
003166  001401                      BEQ     BRZ3
003170  001004                      BNE     TS40
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 763            <====
003172                      BRZ3:
003172  012742  000044              MOV     #44,-(R2)       ;MOVE TO MAILBOX #  *******  44  *******
003176  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003200  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
                            ;*******************************************************************************
003202  005212              TS40:   INC     (R2)            ;UPDATE TEST NUMBER
003204  022712  000040              CMP     #40,(R2)        ;SEQUENCE ERROR?
003210  001014                      BNE     TS41-10         ;BR TO ERROR HALT ON SEQ ERROR
                                    ;FIRST WITH N-BIT ON
003212  000257                      CCC                     ;CC=1000: JUST N-BIT
003214  000270                      SEN
003216  100001                      BPL     BRN1            ;CHECK OPPOSITE CONDITION
003220  100404                      BMI     BRN2
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 773            <====
003222                      BRN1:
003222  012742  000045              MOV     #45,-(R2)       ;MOVE TO MAILBOX #  *******  45  *******
003226  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
003230  000000                   HALT                        ;IMPROPER BR W/ N=1

                                 ;CHECK WITH N-BIT OFF
003232  000277           BRN2:   SCC                         ;CC=0111
003234  000250                   CLN
003236  100401                   BMI     BRN3                ;CHECK OPPOSITE CONDITION
003240  100004                   BPL     TS41
                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                             ;           CONDITIONAL BRANCH INST. AND    <====
                                                             ;           REPLACE THE MOVE INSTRUCTION    <====
                                                             ;           WHICH FOLLOWS W/ 763            <====
003242                   BRN3:
003242  012742  000046           MOV     #46,-(R2)           ;MOVE TO MAILBOX #  *******  46  *******
003246  005242                   INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
003250  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
                         ;*******************************************************************************
003252  005212           TS41:   INC     (R2)                ;UPDATE TEST NUMBER
003254  022712  000041           CMP     #41,(R2)            ;SEQUENCE ERROR?
003260  001014                   BNE     TS42-10             ;BR TO ERROR HALT ON SEQ ERROR
                                 ;FIRST WITH V-BIT ON
003262  000257                   CCC                         ;CC=0010: JUST V-BIT
003264  000262                   SEV
003266  102001                   BVC     BRV1                ;CHECK OPPOSITE CONDITION
003270  102404                   BVS     BRV2
                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                             ;           CONDITIONAL BRANCH INST. AND    <====
                                                             ;           REPLACE THE MOVE INSTRUCTION    <====
                                                             ;           WHICH FOLLOWS W/ 773            <====
003272                   BRV1:
003272  012742  000047           MOV     #47,-(R2)           ;MOVE TO MAILBOX #  *******  47  *******
003276  005242                   INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
003300  000000                   HALT                        ;IMPROPER BR W/ V=1
                                 ;CHECK WITH V-BIT OFF
003302  000277           BRV2:   SCC                         ;CC=1101: ALL BVT V-BIT
003304  000242                   CLV
003306  102401                   BVS     BRV3                ;CHECK OPPOSITE CONDITION
003310  102004                   BVC     TS42
                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                             ;           CONDITIONAL BRANCH INST. AND    <====
                                                             ;           REPLACE THE MOVE INSTRUCTION    <====
                                                             ;           WHICH FOLLOWS W/ 763            <====
003312                   BRV3:
003312  012742  000050           MOV     #50,-(R2)           ;MOVE TO MAILBOX #  *******  50  *******
003316  005242                   INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
003320  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
                                    ;*******************************************************************************
003322  005212                      TS42:   INC     (R2)            ;UPDATE TEST NUMBER
003324  022712  000042                      CMP     #42,(R2)        ;SEQUENCE ERROR?
003330  001014                              BNE     TS43-10         ;BR TO ERROR HALT ON SEQ ERROR
                                            ;FIRST WITH C-BIT ON
003332  000257                              CCC                     ;CC=0001: JUST C-BIT
003334  000261                              SEC
003336  103001                              BCC     BRC1            ;CHECK OPPOSITE CONDITION
003340  103404                              BCS     BRC2
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 773            <====
003342                              BRC1:
003342  012742  000051                      MOV     #51,-(R2)       ;MOVE TO MAILBOX #  *******  51  *******
003346  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003350  000000                              HALT                    ;IMPROPER BR W/ C=1
                                            ;CHECK WITH C-BIT OFF
003352  000277                      BRC2:   SCC                     ;CC=1110
003354  000241                              CLC
003356  103401                              BCS     BRC3            ;CHECK OPPOSITE CONDITION
003360  100404                              BMI     TS43
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 763            <====
003362                              BRC3:
003362  012742  000052                      MOV     #52,-(R2)       ;MOVE TO MAILBOX #  *******  52  *******
003366  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003370  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.
                                        ;*********************************************************************
003372  005212                  TS43:   INC     (R2)            ;UPDATE TEST NUMBER
003374  022712  000043                  CMP     #43,(R2)        ;SEQUENCE ERROR?
003400  001020                          BNE     TS44-10         ;BR TO ERROR HALT ON SEQ ERROR
003402  005000                          CLR     R0              ;TRY THE CLEAR INST.
003404  001404                          BEQ     SOP0A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 775            <====
003406  012742  000053                  MOV     #53,-(R2)       ;MOVE TO MAILBOX #  *******  53  *******
003412  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003414  000000                          HALT                    ;CLR DID NOT SET Z-BIT
003416  005200                  SOP0A:  INC     R0              ;TRY THE INCREMENT INST.
003420  005100                          COM     R0              ;TRY COMPLEMENT
003422  005200                          INC     R0
003424  100404                          BMI     SOP0B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 765            <====
003426  012742  000054                  MOV     #54,-(R2)       ;MOVE TO MAILBOX #  *******  54  *******
003432  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003434  000000                          HALT                    ;NEGATE DID NOT SET N-BIT
003436  005100                  SOP0B:  COM     R0              ;TRY COMPLEMENT INST.
003440  001404                          BEQ     TS44
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 757            <====
003442  012742  000055                  MOV     #55,-(R2)       ;MOVE TO MAILBOX #  *******  55  *******
003446  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003450  000000                          HALT                    ;CUMMULATIVE RESULT OF CLR,INC,NEG AND COM INSTS. FAILED
                                                                ;  OR SEQUENCE ERROR
```

```

                              ;*******************************************************************************
                              ;
                              ;       THIS TEST INTRODUCES THE 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
                              ;*******************************************************************************
003452  005212                TS44:   INC     (R2)            ;UPDATE TEST NUMBER
003454  022712  000044                CMP     #44,(R2)        ;SEQUENCE ERROR?
003460  001021                        BNE     TS45-10         ;BR TO ERROR HALT ON SEQ ERROR
003462  005000                        CLR     R0              ;INITIALIZE
003464  005300                        DEC     R0              ;TRY DECREMENT INST.
003466  100404                        BMI     SOP0C
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                              ;           CONDITIONAL BRANCH INST. AND      <====
                                                              ;           REPLACE THE MOVE INSTRUCTION      <====
                                                              ;           WHICH FOLLOWS W/ 774              <====
003470  012742  000056                MOV     #56,-(R2)       ;MOVE TO MAILBOX #  *******  56  *******
003474  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003476  000000                        HALT                    ;N-BIT NOT SET ON DEC
003500  000261                SOP0C:  SEC                     ;INITIALIZE CARRY
003502  005500                        ADC     R0              ;TRY ADD CARRY INST
003504  001007                        BNE     SOP0D
003506  000261                        SEC                     ;INITIALIZE CARRY
003510  005600                        SBC     R0              ;TRY SUBTRACT-CARRY INST
003512  100004                        BPL     SOP0D
003514  005100                        COM     R0
003516  005200                        INC     R0
003520  005300                        DEC     R0
003522  001404                        BEQ     TS45
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                              ;           CONDITIONAL BRANCH INST. AND      <====
                                                              ;           REPLACE THE MOVE INSTRUCTION      <====
                                                              ;           WHICH FOLLOWS W/ 756              <====
003524                        SOP0D:
003524  012742  000057                MOV     #57,-(R2)       ;MOVE TO MAILBOX #  *******  57  *******
003530  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003532  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
                              ;*******************************************************************************
003534  005212                TS45:   INC     (R2)            ;UPDATE TEST NUMBER
```

```
003536  022712  000045              CMP     #45,(R2)        ;SEQUENCE ERROR?
003542  001012                      BNE     TS46-10         ;BR TO ERROR HALT ON SEQ ERROR
003544  105000                      CLRB    R0              ;TRY CLEARING EVEN BYTE OF REGISTER
003546  001404                      BEQ     SOPB0A
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 775              <====
003550  012742  000060              MOV     #60,-(R2)       ;MOVE TO MAILBOX #  *******  60  *******
003554  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003556  000000                      HALT                    ;CLRB DID NOT SET Z-BIT
003560  105100              SOPB0A: COMB    R0              ;TRY SETTING EVEN BYTE OF REGISTER
003562  100002                      BPL     SOPB0B
003564  105200                      INCB    R0              ;TRY INCREMENTING EVEN BYTE OF REGISTER>>
003566  001404                      BEQ     TS46
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 765              <====
003570                              SOPB0B:
003570  012742  000061              MOV     #61,-(R2)       ;MOVE TO MAILBOX #  *******  61  *******
003574  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003576  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.
                            ;*****************************************************************************
003600  005212              TS46:   INC     (R2)            ;UPDATE TEST NUMBER
003602  022712  000046              CMP     #46,(R2)        ;SEQUENCE ERROR?
003606  001014                      BNE     TS47-10         ;BR TO ERROR HALT ON SEQ ERROR
003610  005000                      CLR     R0              ;INITIALIZE R0
003612  005010                      CLR     (R0)            ;TRY CLEAR INST W/MODE 1
003614  001404                      BEQ     SOP1A
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 774              <====
003616  012742  000062              MOV     #62,-(R2)       ;MOVE TO MAILBOX #  *******  62  *******
003622  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003624  000000                      HALT                    ;CLR DID NOT SET Z-BIT
003626  005310              SOP1A:  DEC     (R0)            ;TRY DECREMENT INST W/MODE 1
003630  100003                      BPL     SOP1B
003632  000261                      SEC                     ;INITIALIZE CARRY
003634  005510                      ADC     (R0)            ;TRY ADD-CARRY W/MODE 1
003636  001404                      BEQ     TS47
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
```

```
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 763            <====
003640                                  SOP1B:
003640  012742  000063                          MOV     #63,-(R2)       ;MOVE TO MAILBOX #  *******  63  *******
003644  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003646  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
                                        ;*******************************************************************************
003650  005212                          TS47:   INC     (R2)            ;UPDATE TEST NUMBER
003652  022712  000047                          CMP     #47,(R2)        ;SEQUENCE ERROR?
003656  001020                                  BNE     TS50-10         ;BR TO ERROR HALT ON SEQ ERROR
003660  005000                                  CLR     R0              ;INITIALIZE R0
003662  005010                                  CLR     (R0)            ;INITIALIZE LOC. 0
003664  005110                                  COM     (R0)
003666  105010                                  CLRB    (R0)            ;TRY TO CLEAR BYTE 0
003670  001404                                  BEQ     SOPB1A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 772            <====
003672  012742  000064                          MOV     #64,-(R2)       ;MOVE TO MAILBOX #  *******  64  *******
003676  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003700  000000                                  HALT                    ;CLRB DID NOT SET Z-BIT
003702  005210                          SOPB1A: INC     (R0)            ;INCREMENT TO TEST WORD
003704  100005                                  BPL     SOPB1B
003706  105110                                  COMB    (R0)            ;COMPLEMENT:  ODD BYTE = 376
003710  105210                                  INCB    (R0)            ;INC:  ODD BYTE = 377
003712  100002                                  BPL     SOPB1B
003714  105210                                  INCB    (R0)            ;INCREMENT ODD BYTE=0
003716  001404                                  BEQ     TS50
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 757            <====
003720                                  SOPB1B:
003720  012742  000065                          MOV     #65,-(R2)       ;MOVE TO MAILBOX #  *******  65  *******
003724  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003726  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
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                                        ;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
                                        ;**************************************************************************
003730  005212                          TS50:   INC     (R2)            ;UPDATE TEST NUMBER
003732  022712  000050                          CMP     #50,(R2)        ;SEQUENCE ERROR?
003736  001022                                  BNE     TS51-10         ;BR TO ERROR HALT ON SEQ ERROR
003740  005000                                  CLR     R0              ;INITIALIZE R0
003742  005010                                  CLR     (R0)            ;INITIALIZE LOC. 0
003744  005110                                  COM     (R0)
003746  005200                                  INC     R0              ;R0=ODD BYTE
003750  105010                                  CLRB    (R0)            ;TRY TO CLEAR BYTE 1
003752  001404                                  BEQ     SOPB1C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 771           <====
003754  012742  000066                          MOV     #66,-(R2)       ;MOVE TO MAILBOX #  *******  66  *******
003760  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003762  000000                                  HALT                    ;CLRB DID NOT SET Z-BIT
003764  005300                          SOPB1C: DEC     R0              ;R0=WORD ADDR.
003766  005210                                  INC     (R0)            ;INCREMENT TO TEST WORD
003770  005200                                  INC     R0              ;R0=ODD BYTE
003772  105110                                  COMB    (R0)            ;TRY TO COMPLEMENT BYTE 1
003774  105210                                  INCB    (R0)
003776  100002                                  BPL     SOPB1D
004000  105210                                  INCB    (R0)            ;TRY TO INCREMENT BYTE 1
004002  001404                                  BEQ     TS51
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 755           <====
004004                                  SOPB1D:
004004  012742  000067                          MOV     #67,-(R2)       ;MOVE TO MAILBOX #  *******  67  *******
004010  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004012  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.
                                        ;**************************************************************************
004014  005212                          TS51:   INC     (R2)            ;UPDATE TEST NUMBER
004016  022712  000051                          CMP     #51,(R2)        ;SEQUENCE ERROR?
```

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004022  001023                   BNE     TS52-10         ;BR TO ERROR HALT ON SEQ ERROR
004024  005000                   CLR     R0              ;SET R0=400
004026  105100                   COMB    R0
004030  005200                   INC     R0
004032  005010                   CLR     (R0)            ;CLEAR 400
004034  005110                   COM     (R0)            ;INITIALIZE: 400=-1
004036  005020                   CLR     (R0)+           ;TRY CLEARING WITH MODE 2
004040  001404                   BEQ     SOPZA
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                         ;           CONDITIONAL BRANCH INST. AND    <====
                                                         ;           REPLACE THE MOVE INSTRUCTION    <====
                                                         ;           WHICH FOLLOWS W/ 770            <====
004042  012742  000070           MOV     #70,-(R2)       ;MOVE TO MAILBOX #  *******  70  *******
004046  005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004050  000000                   HALT                    ;CLR INST DID NOT SET Z-BIT
004052  005300           SOPZA:  DEC     R0              ;RESET R0
004054  005300                   DEC     R0
004056  005120                   COM     (R0)+           ;TRY COMPLEMENTING WITH MODE 2
004060  100004                   BPL     SOP2B
004062  005300                   DEC     R0              ;RESET R0
004064  005300                   DEC     R0
004066  005220                   INC     (R0)+           ;TRY INCREMENTING WITH MODE 2
004070  001404                   BEQ     TS52
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                         ;           CONDITIONAL BRANCH INST. AND    <====
                                                         ;           REPLACE THE MOVE INSTRUCTION    <====
                                                         ;           WHICH FOLLOWS W/ 754            <====
004072                   SOP2B:
004072  012742  000071           MOV     #71,-(R2)       ;MOVE TO MAILBOX #  *******  71  *******
004076  005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004100  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.
                         ;*****************************************************************************
004102  005212           TS52:   INC     (R2)            ;UPDATE TEST NUMBER
004104  022712  000052           CMP     #52,(R2)        ;SEQUENCE ERROR?
004110  001023                   BNE     TS53-10         ;BR TO ERROR HALT ON SEQ ERROR
004112  005000                   CLR     R0              ;SET R0=400
004114  105100                   COMB    R0
004116  005200                   INC     R0
004120  005010                   CLR     (R0)            ;CLEAR 400
004122  005110                   COM     (R0)            ;INITIALIZE: 400=-1
004124  105020                   CLRB    (R0)+           ;TRY TO CLEAT 400 W/MODE 2
004126  001404                   BEQ     SOPB2A
```

```
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 770            <====
 004130  012742  000072            MOV     #72,-(R2)       ;MOVE TO MAILBOX #  *******  72  *******
 004134  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 004136  000000                    HALT                    ;CLR DID NOT SET Z-BIT
 004140  005300           SOPB2A:  DEC     R0              ;RESULT R0=400
 004142  005210                    INC     (R0)            ;INC 400 TO TEST WORD
 004144  105110                    COMB    (R0)
 004146  105220                    INCB    (R0)+           ;TRY TO INC EVEN BYTE
 004150  100003                    BPL     SOPB2B
 004152  005300                    DEC     R0              ;RESET R0=400
 004154  105220                    INCB    (R0)+           ;TRY INCREMENT OF EVEN BYTE
 004156  001404                    BEQ     TS53
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 754            <====
 004160                   SOPB2B:
 004160  012742  000073            MOV     #73,-(R2)       ;MOVE TO MAILBOX #  *******  73  *******
 004164  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 004166  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.
                          ;*************************************************************************************
 004170  005212           TS53:    INC     (R2)            ;UPDATE TEST NUMBER
 004172  022712  000053            CMP     #53,(R2)        ;SEQUENCE ERROR?
 004176  001026                    BNE     TS54-10         ;BR TO ERROR HALT ON SEQ ERROR
 004200  005000                    CLR     R0              ;SET R0=400
 004202  105100                    COMB    R0
 004204  005200                    INC     R0
 004206  005010                    CLR     (R0)            ;CLEAR LOC 400
 004210  005110                    COM     (R0)            ;INITIALIZE: 400=-1
 004212  005200                    INC     R0              ;R0=ODD BYTE
 004214  105020                    CLRB    (R0)+           ;TRY TO CLEAR ODD BYTE
 004216  001404                    BEQ     SOPB2C
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 767            <====
 004220  012742  000074            MOV     #74,-(R2)       ;MOVE TO MAILBOX #  *******  74  *******
 004224  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 004226  000000                    HALT                    ;CLRB DID NOT SET Z-BIT
 004230  005300           SOPB2C:  DEC     R0              ;R0=WORD ADDR.
 004232  005300                    DEC     R0
 004234  005220                    INC     (R0)+           ;INCREMENT WORD
 004236  005300                    DEC     R0              ;POINT TO ODD BYTE
 004240  105110                    COMB    (R0)            ;COMPLEMENT ODD BYTE
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004242  105220                  INCB    (R0)+           ;TRY TO INCREMENT ODD BYTE
004244  100003                  BPL     SOPB2D
004246  005300                  DEC     R0              ;RESET R0 TO ODD BYTE
004250  105220                  INCB    (R0)+           ;TRY TO INCREMENT ODD BYTE
004252  001404                  BEQ     TS54
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 751            <====
004254                  SOPB2D:
004254  012742  000075          MOV     #75,-(R2)       ;MOVE TO MAILBOX #  *******  75  *******
004260  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004262  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
                        ;*******************************************************************************
004264  005212          TS54:   INC     (R2)            ;UPDATE TEST NUMBER
004266  022712  000054          CMP     #54,(R2)        ;SEQUENCE ERROR?
004272  001035                  BNE     TS55-10         ;BR TO ERROR HALT ON SEQ ERROR
004274  005000                  CLR     R0              ;SET R0=0
004276  005200                  INC     R0              ;    R0=1
004300  005400                  NEG     R0              ;TRY NEGATE MODE 0:  R0=-1
004302  100003                  BPL     NEG00           ;CC=1001?
004304  001402                  BEQ     NEG00
004306  102401                  BVS     NEG00
004310  103404                  BCS     NEG01
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 770            <====
004312                  NEG00:
004312  012742  000076          MOV     #76,-(R2)       ;MOVE TO MAILBOX #  *******  76  *******
004316  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004320  000000                  HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY

004322  005200          NEG01:  INC     R0              ;TEST DATA RESULT
004324  001404                  BEQ     NEG02
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 762            <====
004326  012742  000077          MOV     #77,-(R2)       ;MOVE TO MAILBOX #  *******  77  *******
004332  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004334  000000                  HALT                    ;DATA RESULT OF NEGATE INCORRECT

004336  105100          NEG02:  COMB    R0              ;R0=377
004340  105400                  NEGB    R0              ;R0=1
004342  100403                  BMI     NEG03           ;CC=0001?
004344  001402                  BEQ     NEG03
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004346  102401                  BVS     NEG03
004350  103404                  BCS     NEG04
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 750              <====
004352                          NEG03:
004352  012742  000100          MOV     #100,-(R2)      ;MOVE TO MAILBOX #  *******  100  *******
004356  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004360  000000                  HALT                    ;NEGB DID NOT SET CC'S CORRECTLY
004362  005300          NEG04:  DEC     R0              ;TEST DATA RESULT
004364  001404                  BEQ     TS55
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 742              <====
004366  012742  000101          MOV     #101,-(R2)      ;MOVE TO MAILBOX #  *******  101  *******
004372  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004374  000000                  HALT                    ;DATA RESULT OF NEGB INCORRECT
                                                        ;  OR SEQUENCE ERROR
                        ;*******************************************************************************
                        ;TEST 55        TEST MODE 1 USING NEGATE INST.
                        ;*******************************************************************************
004376  005212          TS55:   INC     (R2)            ;UPDATE TEST NUMBER
004400  022712  000055          CMP     #55,(R2)        ;SEQUENCE ERROR?
004404  001040                  BNE     TS56-10         ;BR TO ERROR HALT ON SEQ ERROR
004406  005000                  CLR     R0              ;POINT TO LOC. 0
004410  005010                  CLR     (R0)            ;CLEAR LOC. 0
004412  005210                  INC     (R0)            ;LOC. 0=1
004414  005410                  NEG     (R0)            ;TRY NEG. LOC. 0=-1
004416  100003                  BPL     NEG10           ;CC=1001
004420  001402                  BEQ     NEG10
004422  102401                  BVS     NEG10
004424  103404                  BCS     NEG11
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 767              <====
004426                          NEG10:
004426  012742  000102          MOV     #102,-(R2)      ;MOVE TO MAILBOX #  *******  102  *******
004432  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004434  000000                  HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY

004436  005237  000000  NEG11:  INC     @#0             ;TEST DATA RESULT
004442  001404                  BEQ     NEG12
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 760              <====
004444  012742  000103          MOV     #103,-(R2)      ;MOVE TO MAILBOX #  *******  103  *******
004450  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004452  000000                  HALT                    ;DATA RESULT OF NEGATE INCORRECT
004454  105110          NEG12:  COMB    (R0)            ;LOC. 0=377
004456  105410                  NEGB    (R0)            ;TRY NEGB LOC. 0=1
004460  100403                  BMI     NEG13           ;CC=0001?
004462  001402                  BEQ     NEG13
```

```
004464  102401                  BVS     NEG13
004466  103404                  BCS     NEG14
                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                ;           WHICH FOLLOWS W/ 746             <====
004470                          NEG13:
004470  012742  000104          MOV     #104,-(R2)      ;MOVE TO MAILBOX #  *******  104  *******
004474  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004476  000000                  HALT                    ;NEGB DID NOT SET CC'S CORRECTLY
004500  005337  000000  NEG14:  DEC     @#0             ;TEST DATA RESULT
004504  001404                  BEQ     TS56
                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                ;           WHICH FOLLOWS W/ 737             <====
004506  012742  000105          MOV     #105,-(R2)      ;MOVE TO MAILBOX #  *******  105  *******
004512  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004514  000000                  HALT                    ;DATA RESULT OF NEGB INCORRECT
                                                        ;  OR SEQUENCE ERROR
                        ;*******************************************************************************************
                        ;TEST 56        TEST MODE 2 USING NEGATE INSTRUCTION
                        ;*******************************************************************************************
004516  005212          TS56:   INC     (R2)            ;UPDATE TEST NUMBER
004520  022712  000056          CMP     #56,(R2)        ;SEQUENCE ERROR?
004524  001032                  BNE     TS57-10         ;BR TO ERROR HALT ON SEQ ERROR
004526  005000                  CLR     R0              ;POINT TO LOC. 0
004530  005010                  CLR     (R0)            ;CLEAR LOC. 0
004532  005210                  INC     (R0)            ;LOC. 0=1
004534  005420                  NEG     (R0)+           ;TRY NEG.: LOC. 0=-1
004536  100003                  BPL     NEG20           ;CC=1001?
004540  001402                  BEQ     NEG20
004542  102401                  BVS     NEG20
004544  103404                  BCS     NEG21
                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                ;           WHICH FOLLOWS W/ 767             <====
004546                          NEG20:
004546  012742  000106          MOV     #106,-(R2)      ;MOVE TO MAILBOX #  *******  106  *******
004552  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004554  000000                  HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY
004556  105300          NEG21:  DECB    R0              ;R0=LOC. 0
004560  105300                  DECB    R0
004562  105420                  NEGB    (R0)+           ;BYTE 0=1   R0=1
004564  105420                  NEGB    (R0)+           ;BYTE 1=1   R0=2
004566  105340                  DECB    -(R0)           ;R0=1  LOC. 0=01
004570  005300                  DEC     R0              ;R0=0
004572  001404                  BEQ     NEG22
                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                ;           WHICH FOLLOWS W/ 754             <====
004574  012742  000107          MOV     #107,-(R2)      ;MOVE TO MAILBOX #  *******  107  *******
004600  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004602  000000                  HALT                    ;REGISTER NOT INCREMENTED CORRECTLY
```

```
004604  005337  000000          NEG22:  DEC     @#0             ;LOC. 0=0
004610  001404                          BEQ     TS57
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 745            <====
004612  012742  000110                  MOV     #110,-(R2)      ;MOVE TO MAILBOX #  *******  110  *******
004616  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004620  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.
                                ;*****************************************************************************
004622  005212                  TS57:   INC     (R2)            ;UPDATE TEST NUMBER
004624  022712  000057                  CMP     #57,(R2)        ;SEQUENCE ERROR?
004630  001020                          BNE     TS60-10         ;BR TO ERROR HALT ON SEQ ERROR
004632  005000                          CLR     R0              ;SET R0=400
004634  105100                          COMB    R0
004636  005200                          INC     R0
004640  005010                          CLR     (R0)            ;CLEAR LOC 400
004642  005030                          CLR     @(R0)+          ;TRY TO CLEAR LOC 0 USING MODE 3 ;R0=402
004644  001404                          BEQ     SOP3A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 771            <====
004646  012742  000111                  MOV     #111,-(R2)      ;MOVE TO MAILBOX #  *******  111  *******
004652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004654  000000                          HALT                    ;CLR DID NOT SET Z-BIT
004656  005300                  SOP3A:  DEC     R0              ;RESET R0=400
004660  005300                          DEC     R0
004662  005130                          COM     @(R0)+          ;TRY TO COMPLEMENT LOC 0 OF MODE 3  ;R0=402
004664  100002                          BPL     SOP3B
004666  005230                          INC     @(R0)+          ;TRY TO INCREMENT LOC 0 W/MODE 3  ;R0=404
004670  001404                          BEQ     TS60
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 757            <====
004672                          SOP3B:
004672  012742  000112                  MOV     #112,-(R2)      ;MOVE TO MAILBOX #  *******  112  *******
```

```
004676  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004700  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.
                        ;*******************************************************************************
004702  005212          TS60:   INC     (R2)            ;UPDATE TEST NUMBER
004704  022712  000060          CMP     #60,(R2)        ;SEQUENCE ERROR?
004710  001026                  BNE     TS61-10         ;BR TO ERROR HALT ON SEQ ERROR
004712  005004                  CLR     R4              ;SET R4=400
004714  105104                  COMB    R4
004716  005204                  INC     R4
004720  005000                  CLR     R0              ;INITIALIZE LOC. 0=-1
004722  005010                  CLR     (R0)
004724  005110                  COM     (R0)            ;LOC. 0=-1
004726  105034                  CLRB    @(R4)+          ;TRY TO CLEAR EVEN BYTE ;LOC. 0=177400  R4=402
004730  001404                  BEQ     SOPB3A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 767            <====
004732  012742  000113          MOV     #113,-(R2)      ;MOVE TO MAILBOX #  *******  113  *******
004736  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004740  000000                  HALT                    ;CLRB DID NOT SET Z-BIT
004742  005304          SOPB3A: DEC     R4              ;RESET POINTER  R4=400
004744  005304                  DEC     R4
004746  005234                  INC     @(R4)+          ;TRY INCREMENTING WORD  LOC.0=177401  R4=402
004750  100006                  BPL     SOPB3B
004752  105434                  NEGB    @(R4)+          ;TRY TO NEGATE EVEN BYTE ;LOC.0=-1 R4=404
004754  100004                  BPL     SOPB3B
004756  005304                  DEC     R4              ;R4=402
004760  005304                  DEC     R4
004762  105234                  INCB    @(R4)+          ;TRY TO INCREMENT EVEN BYTE ;LOC. 0=17400
004764  001404                  BEQ     TS61
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 751            <====
004766                  SOPB3B:
004766  012742  000114          MOV     #114,-(R2)      ;MOVE TO MAILBOX #  *******  114  *******
004772  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004774  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.  RO SERVES AS THE TABLE POINTER.
                                ;       RO 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.  RO 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.
                                ;*****************************************************************************
004776  005212                  TS61:   INC     (R2)            ;UPDATE TEST NUMBER
005000  022712  000061                  CMP     #61,(R2)        ;SEQUENCE ERROR?
005004  001024                          BNE     TS62-10         ;BR TO ERROR HALT ON SEQ ERROR
005006  005000                          CLR     R0              ;SET R0=400
005010  105100                          COMB    R0
005012  005200                          INC     R0
005014  005030                          CLR     @(R0)+          ;INITIALIZE
005016  005130                          COM     @(R0)+          ;LOC 0=-1 R0=404
005020  105030                          CLRB    @(R0)+          ;TRY TO CLEAR ODD BYTE LOC. 0=377 R0=406
005022  001404                          BEQ     SOPB3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 770             <====
005024  012742  000115                  MOV     #115,-(R2)      ;MOVE TO MAILBOX #  *******  115  *******
005030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005032  000000                          HALT                    ;CLRB DID NOT SET Z-BIT
005034  005300                  SOPB3C: DEC     R0              ;RESET R0=402
005036  005300                          DEC     R0
005040  005300                          DEC     R0              ;POINT TO EVEN BYTE ADDR.
005042  005300                          DEC     R0
005044  005230                          INC     @(R0)+          ;INCREMENT WORD LOC. 0=400 R0=404
005046  105430                          NEGB    @(R0)+          ;TRY TO NEGATE ODD BYTE LOC. 0=177400 R0=406
005050  100002                          BPL     SOPB3D
005052  105230                          INCB    @(R0)+          ;TRY TO INCREMENT ODD BYTE LOC.0=C R0=410
005054  001404                          BEQ     TS62
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 753             <====
005056                          SOPB3D:
005056  012742  000116                  MOV     #116,-(R2)      ;MOVE TO MAILBOX #  *******  116  *******
005062  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005064  000000                          HALT                    ;CUMMULATIVE RESULT OF ABOVE INSTS FAILED
                                                                ;  OR SEQUENCE ERROR
                                ;*****************************************************************************
                                ;TEST 62        TEST MODE 3 USING NEGATE INSTRUCTION
                                ;*****************************************************************************
005066  005212                  TS62:   INC     (R2)            ;UPDATE TEST NUMBER
```

```
005070  022712  000062                  CMP     #62,(R2)        ;SEQUENCE ERROR?
005074  001054                          BNE     TS63-10         ;BR TO ERROR HALT ON SEQ ERROR
005076  005000                          CLR     R0              ;R0=400
005100  105100                          COMB    R0
005102  005200                          INC     R0
005104  005010                          CLR     (R0)            ;LOC. 400=0
005106  005004                          CLR     R4              ;R4=0
005110  005014                          CLR     (R4)            ;LOC. 0=0
005112  005214                          INC     (R4)            ;LOC. 0=1
005114  005430                          NEG     @(R0)+          ;TRY NEGATE   LOC. 0=-1  R0=402
005116  100003                          BPL     NEG30           ;CC=1001?
005120  001402                          BEQ     NEG30
005122  102401                          BVS     NEG30
005124  103404                          BCS     NEG31
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 763              <====
005126                          NEG30:
005126  012742  000117                  MOV     #117,-(R2)      ;MOVE TO MAILBOX #  *******  117  *******
005132  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005134  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
005136  005214                  NEG31:  INC     (R4)            ;LOC. 0=0
005140  001404                          BEQ     NEG32
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 755              <====
005142  012742  000120                  MOV     #120,-(R2)      ;MOVE TO MAILBOX #  *******  120  *******
005146  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005150  000000                          HALT                    ;DATA RESULT OF NEG INCORRECT
005152  105137  000001          NEG32:  COMB    @#1             ;LOC 0=177400
005156  005237  000000                  INC     @#0             ;LOC. 0=177401
005162  105430                          NEGB    @(R0)+          ;TRY NEGB LOC. 0=177777  R0=404
005164  100404                          BMI     NEG33
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 743              <====
005166  012742  000121                  MOV     #121,-(R2)      ;MOVE TO MAILBOX #  *******  121  *******
005172  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005174  000000                          HALT                    ;NEGB FAILED WITH EVEN BYTE
005176  105430                  NEG33:  NEGB    @(R0)+          ;TRY NEGB  LOC.0=777  R0=406
005200  100004                          BPL     NEG34
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 735              <====
005202  012742  000122                  MOV     #122,-(R2)      ;MOVE TO MAILBOX #  *******  122  *******
005206  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005210  000000                          HALT                    ;NEGB FAILED WITH ODD BYTE
005212  105137  000001          NEG34:  COMB    @#1             ;LOC. 0=177377
005216  105237  000001                  INCB    @#1             ;LOC. 0=177777
005222  005214                          INC     (R4)            ;LOC. 0=0
005224  001404                          BEQ     TS63
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
```

```
                                                                    ;               CONDITIONAL BRANCH INST. AND    <====
                                                                    ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;               WHICH FOLLOWS W/ 723            <====
005226  012742  000123                  MOV     #123,-(R2)          ;MOVE TO MAILBOX #  *******  123  *******
005232  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
005234  000000                          HALT                        ;DATA RESULT OF NEGB'S INCORRECT
                                                                    ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 4 SINGLE OPERAND INSTRUCTIONS.
                                ;RO IS SET TO 400. A CLR INSTRUCTION IS EXECUTED IN MODE 4 TO CLEAR
                                ;LOC. 376. RO 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
                                ;*******************************************************************************
005236  005212                  TS63:   INC     (R2)                ;UPDATE TEST NUMBER
005240  022712  000063                  CMP     #63,(R2)            ;SEQUENCE ERROR?
005244  001021                          BNE     TS64-10             ;BR TO ERROR HALT ON SEQ ERROR
005246  005000                          CLR     R0                  ;SET R0=400
005250  105100                          COMB    R0
005252  005200                          INC     R0
005254  005040                          CLR     -(R0)               ;TRY TO CLEAR USING MODE 4
005256  001404                          BEQ     SOP4A
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 772            <====
005260  012742  000124                  MOV     #124,-(R2)          ;MOVE TO MAILBOX #  *******  124  *******
005264  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
005266  000000                          HALT                        ;CLR DID NOT SET Z-BIT
005270  005200                  SOP4A:  INC     R0                  ;RESET R0
005272  005200                          INC     R0
005274  005140                          COM     -(R0)               ;TRY TO COMPLEMENT USING MODE 4
005276  100004                          BPL     SOP4B
005300  005200                          INC     R0                  ;MOVE POINTER
005302  005200                          INC     R0
005304  005240                          INC     -(R0)
005306  001404                          BEQ     TS64
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 756            <====
005310                          SOP4B:
005310  012742  000125                  MOV     #125,-(R2)          ;MOVE TO MAILBOX #  *******  125  *******
005314  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
005316  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
                                        ;*****************************************************************************
005320  005212                          TS64:   INC     (R2)            ;UPDATE TEST NUMBER
005322  022712  000064                          CMP     #64,(R2)        ;SEQUENCE ERROR?
005326  001025                                  BNE     TS65-10         ;BR TO ERROR HALT ON SEQ ERROR
005330  012700  000370                          MOV     #370,R0         ;CLEAR LOCATION 370-376
005334  005020                                  CLR     (R0)+           ;370
005336  005020                                  CLR     (R0)+           ;372
005340  005020                                  CLR     (R0)+           ;374
005342  005010                                  CLR     (R0)            ;376
005344  005000                                  CLR     R0              ;SET R0=376 (LOW BYTE)
005346  005020                                  CLR     (R0)+
005350  105400                                  NEGB    R0
005352  005050                                  CLR     @-(R0)          ;TRY TO CLEAR LOC 0 W/MODE 5
005354  001404                                  BEQ     SOP5A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
005356  012742  000126                          MOV     #126,-(R2)      ;MOVE TO MAILBOX #  *******  126  *******
005362  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005364  000000                                  HALT                    ;CLR DID NOT SET Z-BIT
005366  005200                          SOP5A:  INC     R0              ;RESET R0
005370  005200                                  INC     R0
005372  005150                                  COM     @-(R0)          ;TRY TO COMPLEMENT LOC. 0 W/MODE 5
005374  100002                                  BPL     SOP5B
005376  005250                                  INC     @-(R0)          ;TRY TO INCREMENT LOC. 0 W/MODE 5
005400  001404                                  BEQ     TS65
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 752            <====
005402                                  SOP5B:
005402  012742  000127                          MOV     #127,-(R2)      ;MOVE TO MAILBOX #  *******  127  *******
005406  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005410  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
                                        ;*******************************************************************************
005412  005212                          TS65:   INC     (R2)            ;UPDATE TEST NUMBER
005414  022712  000065                          CMP     #65,(R2)        ;SEQUENCE ERROR?
005420  001020                                  BNE     TS66-10         ;BR TO ERROR HALT ON SEQ ERROR
005422  005000                                  CLR     R0              ;SET R0=400
005424  105100                                  COMB    R0
005426  005200                                  INC     R0
005430  005060  177400                          CLR     -400(R0)        ;TRY TO CLEAR LOCATION 0 W/MODE 6
005434  001404                                  BEQ     SOP6A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 771           <====
005436  012742  000130                          MOV     #130,-(R2)      ;MOVE TO MAILBOX #  *******  130  *******
005442  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005444  000000                                  HALT                    ;CLR DID NOT SET Z-BIT
005446  005160  177400                  SOP6A:  COM     -400(R0)        ;TRY TO COMPLEMENT LOCATION 0 W/MODE 6
005452  100003                                  BPL     SOP6B
005454  005260  177400                          INC     -400(R0)        ;TRY TO INCREMENT LOCATION 0 W/MODE 6
005460  001404                                  BEQ     TS66
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 757           <====
005462                                  SOP6B:
005462  012742  000131                          MOV     #131,-(R2)      ;MOVE TO MAILBOX #  *******  131  *******
005466  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005470  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.
                                        ;*******************************************************************************
005472  005212                          TS66:   INC     (R2)            ;UPDATE TEST NUMBER
005474  022712  000066                          CMP     #66,(R2)        ;SEQUENCE ERROR?
005500  001021                                  BNE     TS67-10         ;BR TO ERROR HALT ON SEQ ERROR
005502  005000                                  CLR     R0              ;SET R0=400
005504  105100                                  COMB    R0
005506  005200                                  INC     R0
005510  005210                                  INC     (R0)            ;R0=1
005512  005070  000002                          CLR     @2(R0)          ;TRY TO CLEAR LOC. 0 W/MODE 7
005516  001404                                  BEQ     SOP7A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
```

```
                                                        ;          CONDITIONAL BRANCH INST. AND      <====
                                                        ;          REPLACE THE MOVE INSTRUCTION      <====
                                                        ;          WHICH FOLLOWS W/ 770              <====
005520  012742  000132            MOV     #132,-(R2)    ;MOVE TO MAILBOX #  *******  132  *******
005524  005242                    INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
005526  000000                    HALT                  ;CLR DID NOT SET Z-BIT
005530  005170  000002   SOP7A:   COM     @2(R0)        ;TRY TO COMPLEMENT LOC. 0 W/MODE 7
005534  100003                    BPL     SOP7B
005536  005270  000002            INC     @2(R0)        ;TRY TO INCREMENT LOC. 0 W/MODE 7
005542  001404                    BEQ     TS67
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;          CONDITIONAL BRANCH INST. AND      <====
                                                        ;          REPLACE THE MOVE INSTRUCTION      <====
                                                        ;          WHICH FOLLOWS W/ 756              <====
005544                           SOP7B:
005544  012742  000133            MOV     #133,-(R2)    ;MOVE TO MAILBOX #  *******  133  *******
005550  005242                    INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
005552  000000                    HALT                  ;TEST CUMMULATIVE RESULT OF ABOVE INSTS.
                                                        ;  OR SEQUENCE ERROR

                                 ;*******************************************************************************
                                 ;TEST 67         TEST MODE 4 WITH NEGATE INSTRUCTION
                                 ;*******************************************************************************
005554  005212                   TS67:    INC     (R2)          ;UPDATE TEST NUMBER
005556  022712  000067            CMP     #67,(R2)      ;SEQUENCE ERROR?
005562  001024                    BNE     TS70-10       ;BR TO ERROR HALT ON SEQ ERROR
005564  005000                    CLR     R0
005566  005010                    CLR     (R0)
005570  005120                    COM     (R0)+         ;LOC. 0=177777,  R0=2
005572  005440                    NEG     -(R0)         ;TRY NEGATE, LOC. 0=1
005574  100403                    BMI     NEG40         ;CC=0001?
005576  001402                    BEQ     NEG40
005600  102401                    BVS     NEG40
005602  103404                    BCS     NEG41
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;          CONDITIONAL BRANCH INST. AND      <====
                                                        ;          REPLACE THE MOVE INSTRUCTION      <====
                                                        ;          WHICH FOLLOWS W/ 767              <====
005604                           NEG40:
005604  012742  000134            MOV     #134,-(R2)    ;MOVE TO MAILBOX #  *******  134  *******
005610  005242                    INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
005612  000000                    HALT                  ;NEG DID NOT SET CC'S CORRECTLY
005614  005400                   NEG41:   NEG     R0            ;TST R0 WITH A NEG.
005616  001404                    BEQ     NEG42
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;          CONDITIONAL BRANCH INST. AND      <====
                                                        ;          REPLACE THE MOVE INSTRUCTION      <====
                                                        ;          WHICH FOLLOWS W/ 761              <====
005620  012742  000135            MOV     #135,-(R2)    ;MOVE TO MAILBOX #  *******  135  *******
005624  005242                    INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
005626  000000                    HALT                  ;R0 NOT DECREMENTED PROPERLY
005630  005310                   NEG42:   DEC     (R0)          ;TEST DTA RESULT OF NEG
005632  001404                    BEQ     TS70
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;          CONDITIONAL BRANCH INST. AND      <====
                                                        ;          REPLACE THE MOVE INSTRUCTION      <====
```

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                                                           ;            WHICH FOLLOWS W/ 753       <====
005634  012742  000136              MOV     #136,-(R2)     ;MOVE TO MAILBOX #  *******  136  *******
005640  005242                      INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
005642  000000                      HALT                   ;DATA RESULT OF NEG INCORRECT
                                                           ;  OR SEQUENCE ERROR
                            ;*******************************************************************************
                            ;TEST 70        TEST MODE 5 WITH NEGATE INSTRUCTION
                            ;*******************************************************************************
005644  005212              TS70:   INC     (R2)           ;UPDATE TEST NUMBER
005646  022712  000070              CMP     #70,(R2)       ;SEQUENCE ERROR?
005652  001031                      BNE     TS71-10        ;BR TO ERROR HALT ON SEQ ERROR
005654  005000                      CLR     R0             ;R0=0
005656  005010                      CLR     (R0)           ;LOC. 0=0
005660  105100                      COMB    R0             ;R0=377
005662  005200                      INC     R0             ;R0=400
005664  005010                      CLR     (R0)           ;SET 400 = 0
005666  005004                      CLR     R4             ;R4=0
005670  005314                      DEC     (R4)           ;LOC. 0=177777
005672  005450                      NEG     @-(R0)         ;TRY NEGATE:  LOC. 0=1
005674  100403                      BMI     NEG50          ;CC=0001?
005676  001402                      BEQ     NEG50
005700  102401                      BVS     NEG50
005702  103404                      BCS     NEG51
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 763            <====
005704                      NEG50:
005704  012742  000137              MOV     #137,-(R2)     ;MOVE TO MAILBOX #  *******  137  *******
005710  005242                      INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
005712  000000                      HALT                   ;NEG DID NOT SET CC'S CORRECTLY
005714  005314              NEG51:  DEC     (R4)
005716  001404                      BEQ     NEG52
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 755            <====
005720  012742  000140              MOV     #140,-(R2)     ;MOVE TO MAILBOX #  *******  140  *******
005724  005242                      INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
005726  000000                      HALT                   ;DATA RESULT OF NEG INCORRECT
005730  105100              NEG52:  COMB    R0
005732  005300                      DEC     R0
005734  001404                      BEQ     TS71
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 746            <====
005736  012742  000141              MOV     #141,-(R2)     ;MOVE TO MAILBOX #  *******  141  *******
005742  005242                      INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
005744  000000                      HALT                   ;REGISTER NOT DECREMENTED PROPERLY
                                                           ;  OR SEQUENCE ERROR
                            ;*******************************************************************************
                            ;TEST 71        TEST MODE 6 WITH NEGATE
                            ;*******************************************************************************
005746  005212              TS71:   INC     (R2)           ;UPDATE TEST NUMBER
005750  022712  000071              CMP     #71,(R2)       ;SEQUENCE ERROR?
```

```
005754  001022                  BNE     TS72-10         ;BR TO ERROR HALT ON SEQ ERROR
005756  005000                  CLR     R0              ;R0=0
005760  005004                  CLR     R4              ;R4=0
005762  105100                  COMB    R0              ;R0=377
005764  005014                  CLR     (R4)            ;LOC. 0=0
005766  105024                  CLRB    (R4)+           ;LOC. 0=177777,  R4=1
005770  105114                  COMB    (R4)            ;LOC. 0=177400
005772  005460  177401          NEG     -377(R0)        ;LOC. 0=400
005776  100403                  BMI     NEG60           ;CC=0001
006000  001402                  BEQ     NEG60
006002  102401                  BVS     NEG60
006004  103404                  BCS     NEG61
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 763             <====
006006                  NEG60:
006006  012742  000142          MOV     #142,-(R2)      ;MOVE TO MAILBOX #  *******  142  *******
006012  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006014  000000                  HALT                    ;NEG DID NOT SET CC'S CORRECTLY
006016  105314          NEG61:  DECB    (R4)
006020  001404                  BEQ     TS72
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 755             <====
006022  012742  000143          MOV     #143,-(R2)      ;MOVE TO MAILBOX #  *******  143  *******
006026  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006030  000000                  HALT                    ;DATA RESULT OF NEG INCORRECT
                                                        ;  OR SEQUENCE ERROR
                        ;*****************************************************************************
                        ;TEST 72        TEST MODE 7 W/ NEGATE
                        ;*****************************************************************************
006032  005212          TS72:   INC     (R2)            ;UPDATE TEST NUMBER
006034  022712  000072          CMP     #72,(R2)        ;SEQUENCE ERROR?
006040  001024                  BNE     TS73-10         ;BR TO ERROR HALT ON SEQ ERROR
006042  005000                  CLR     R0              ;R0=0
006044  005010                  CLR     (R0)            ;LOC. 0=0
006046  005110                  COM     (R0)            ;LOC. 0=177777
006050  105100                  COMB    R0              ;R0=377
006052  105470  000005          NEGB    @5(R0)          ;R0+5=404,  404=1,  LOC. 0=777
006056  100403                  BMI     NEG70           ;CC=0001?
006060  001402                  BEQ     NEG70
006062  102401                  BVS     NEG70
006064  103404                  BCS     NEG71
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 765             <====
006066                  NEG70:
006066  012742  000144          MOV     #144,-(R2)      ;MOVE TO MAILBOX #  *******  144  *******
006072  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006074  000000                  HALT                    ;NEG DID NOT SET CC'S CORRECTLY
006076  105100          NEG71:  COMB    R0              ;R0=0
006100  105120                  COMB    (R0)+           ;LOC. 0=400,  R0=1
006102  105310                  DECB    (R0)            ;LOC. 0=0
```

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006104  005467  171670              NEG     0               ;USE NEG MODE 67 TO TST FOR ZERO
006110  001404                      BEQ     TS73
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 753              <====
006112  012742  000145              MOV     #145,-(R2)      ;MOVE TO MAILBOX #  *******  145  *******
006116  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006120  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
                        ;*******************************************************************************
006122  005212          TS73:       INC     (R2)            ;UPDATE TEST NUMBER
006124  022712  000073              CMP     #73,(R2)        ;SEQUENCE ERROR?
006130  001017                      BNE     SOPB            ;BR TO ERROR HALT ON SEQ ERROR
006132  005027                      CLR     (R7)+           ;CLEAR NEXT LOCATION: (SOPX)
006134  177777          SOPX:       -1                      ;USE MODE 27
006136  001404                      BEQ     SOPA
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 774              <====
006140  012742  000146              MOV     #146,-(R2)      ;MOVE TO MAILBOX #  *******  146  *******
006144  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006146  000000                      HALT                    ;CLR DID NOT SET Z-BIT
006150  005237  006134  SOPA:       INC     @#SOPX          ;INC SOPX W/MODE 37
006154  005467  177754              NEG     SOPX            ;NEGATE SOPX W/MODE 67
006160  100003                      BPL     SOPB
006162  005277  000012              INC     @SOPXAD         ;INC SOPX W/MODE 77
006166  001405                      BEQ     TS74
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 760              <====
006170                  SOPB:
006170  012742  000147              MOV     #147,-(R2)      ;MOVE TO MAILBOX #  *******  147  *******
006174  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006176  000000                      HALT                    ;INC DID NOT SET Z-BIT
                                                            ;  OR SEQUENCE ERROR
006200  006134          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
```

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                                        ;IS EXECUTED AND CONDITIONAL BRANCHES ARE USED TO TEST THE CONDITION
                                        ;CODES.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 74         TEST MODE 0 SOP NON-MODIFYING
                                        ;*******************************************************************************
006202  005212                          TS74:   INC     (R2)            ;UPDATE TEST NUMBER
006204  022712  000074                          CMP     #74,(R2)        ;SEQUENCE ERROR?
006210  001010                                  BNE     TS75-10         ;BR TO ERROR HALT ON SEQ ERROR
006212  005000                                  CLR     R0              ;INITIALIZE R0=0
006214  000277                                  SCC                     ;SET CC=1011
006216  000244                                  CLZ
006220  005700                                  TST     R0              ;TRY TST W/ MODE 0
006222  102403                                  BVS     SNM0A           ;CHECK THAT CC=0100
006224  100402                                  BMI     SNM0A
006226  103401                                  BCS     SNM0A
006230  001404                                  BEQ     TS75
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 767             <====
006232                                  SNM0A:
006232  012742  000150                          MOV     #150,-(R2)      ;MOVE TO MAILBOX #  *******  150  *******
006236  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006240  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 MODE 0 EVEN BYTE W/ SOP NON-MODIFYING
                                        ;*******************************************************************************
006242  005212                          TS75:   INC     (R2)            ;UPDATE TEST NUMBER
006244  022712  000075                          CMP     #75,(R2)        ;SEQUENCE ERROR?
006250  001010                                  BNE     TS76-10         ;BR TO ERROR HALT ON SEQ ERROR
006252  005000                                  CLR     R0              ;INITIALIZE
006254  105100                                  COMB    R0              ;R0=377
006256  000277                                  SCC                     ;SET CC=0111
006260  000250                                  CLN
006262  105700                                  TSTB    R0              ;TRY TST EVEN BYTE
006264  102402                                  BVS     SNMB0A          ;CHECK CC=1000
006266  101401                                  BLOS    SNMB0A
006270  100404                                  BMI     TS76
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 767             <====
006272                                  SNMB0A:
006272  012742  000151                          MOV     #151,-(R2)      ;MOVE TO MAILBOX #  *******  151  *******
006276  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
006300  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
                                ;*******************************************************************************
006302  005212                  TS76:   INC     (R2)                    ;UPDATE TEST NUMBER
006304  022712  000076                  CMP     #76,(R2)                ;SEQUENCE ERROR?
006310  001011                          BNE     TS77-10                 ;BR TO ERROR HALT ON SEQ ERROR
006312  005000                          CLR     R0                      ;POINT TO LOC 0
006314  005010                          CLR     (R0)                    ;CLEAR LOC 0
006316  000277                          SCC                             ;INITIALIZE
006320  000244                          CLZ                             ;CC=1011
006322  005710                          TST     (R0)                    ;TRY TST W/ MODE 1
006324  102403                          BVS     SNM1A                   ;CHECK CC=0100
006326  103402                          BCS     SNM1A
006330  100401                          BMI     SNM1A
006332  001404                          BEQ     TS77
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
006334                          SNM1A:
006334  012742  000152                  MOV     #152,-(R2)              ;MOVE TO MAILBOX #  *******  152  *******
006340  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
006342  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
                                ;*******************************************************************************
006344  005212                  TS77:   INC     (R2)                    ;UPDATE TEST NUMBER
006346  022712  000077                  CMP     #77,(R2)                ;SEQUENCE ERROR?
006352  001026                          BNE     TS100-10                ;BR TO ERROR HALT ON SEQ ERROR
006354  005000                          CLR     R0                      ;POINT TO LOC 0
006356  005010                          CLR     (R0)                    ;CLEAR LOC 0
006360  105110                          COMB    (R0)                    ;COMPLEMENT BYTE 0
006362  000277                          SCC                             ;SET CC=0111
006364  000250                          CLN
006366  105710                          TSTB    (R0)                    ;TRY TST ON EVEN BYTE
006370  102402                          BVS     SNMB1A
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006372  101401                         BLOS    SNMB1A
006374  100404                         BMI     SNMB1B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
006376                         SNMB1A:
006376  012742  000153                 MOV     #153,-(R2)       ;MOVE TO MAILBOX #  *******  153  *******
006402  005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
006404  000000                         HALT                     ;CC'S NOT CORRECT
006406  005000                 SNMB1B: CLR     R0
006410  005200                         INC     R0
006412  000277                         SCC                      ;SET CC=1011
006414  000244                         CLZ
006416  105710                         TSTB    (R0)             ;TRY TO TST AN ODD BYTE
006420  102403                         BVS     SNMB1C           ;CHECK CC=0100
006422  103402                         BCS     SNMB1C
006424  100401                         BMI     SNMB1C
006426  001404                         BEQ     TS100
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 751            <====
006430                         SNMB1C:
006430  012742  000154                 MOV     #154,-(R2)       ;MOVE TO MAILBOX #  *******  154  *******
006434  005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
006436  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
                               ;*******************************************************************************
006440  005212                 TS100:  INC     (R2)             ;UPDATE TEST NUMBER
006442  022712  000100                 CMP     #100,(R2)        ;SEQUENCE ERROR?
006446  001020                         BNE     TS101-10         ;BR TO ERROR HALT ON SEQ ERROR
006450  005000                         CLR     R0               ;INITIALIZE R0=0
006452  005010                         CLR     (R0)             ;CLEAR LOC 0
006454  000277                         SCC                      ;SET CC=1011
006456  000244                         CLZ
006460  005720                         TST     (R0)+            ;TRY TST W/ MODE 2
006462  102403                         BVS     SNM2A            ;CHECK CC=0100
006464  103402                         BCS     SNM2A
006466  100401                         BMI     SNM2A
006470  001404                         BEQ     SNM2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
006472                         SNM2A:
```

```
006472  012742  000155                    MOV     #155,-(R2)      ;MOVE TO MAILBOX #  *******  155  *******
006476  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006500  000000                            HALT                    ;CC'S NOT CORRECT
006502  005300                  SNM2B:    DEC     R0              ;RESET R0
006504  005300                            DEC     R0
006506  001404                            BEQ     TS101
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 757             <====
006510  012742  000156                    MOV     #156,-(R2)      ;MOVE TO MAILBOX #  *******  156  *******
006514  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006516  000000                            HALT                    ;MODE 2 DID NOT INC REQ 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
                                ;*****************************************************************************************
006520  005212                  TS101:    INC     (R2)            ;UPDATE TEST NUMBER
006522  022712  000101                    CMP     #101,(R2)       ;SEQUENCE ERROR?
006526  001042                            BNE     TS102-10        ;BR TO ERROR HALT ON SEQ ERROR
006530  005000                            CLR     R0              ;CLEAR R0
006532  005010                            CLR     (R0)            ;CLEAR LOC 0
006534  105110                            COMB    (R0)            ;SET LOC 0=377
006536  000277                            SCC                     ;SET CC=0111
006540  000250                            CLN
006542  105720                            TSTB    (R0)+           ;TRY TST OF EVEN BYTE
006544  102402                            BVS     SNMB2A
006546  101401                            BLOS    SNMB2A
006550  100404                            BMI     SNMB2B
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 766             <====
006552                          SNMB2A:
006552  012742  000157                    MOV     #157,-(R2)      ;MOVE TO MAILBOX #  *******  157  *******
006556  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006560  000000                            HALT                    ;CC'S NOT SET CORRECTLY
006562  005300                  SNMB2B:   DEC     R0              ;DECREMENT R0
006564  001404                            BEQ     SNMB2C
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 760             <====
006566  012742  000160                    MOV     #160,-(R2)      ;MOVE TO MAILBOX #  *******  160  *******
006572  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006574  000000                            HALT                    ;MODE 2 DID NOT INC REG CORRECTLY
006576  005200                  SNMB2C:   INC     R0              ;POINT TO ODD BYTE
```

```
006600  000277                  SCC                     ;SET CC=1011
006602  000244                  CLZ
006604  105720                  TSTB    (R0)+           ;TRY TST OF ODD BYTE
006606  102403                  BVS     SNMB2D          ;CHECK CC'S=0100
006610  103402                  BCS     SNMB2D
006612  100401                  BMI     SNMB2D
006614  001404                  BEQ     SNMB2E
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;          CONDITIONAL BRANCH INST. AND    <====
                                                        ;          REPLACE THE MOVE INSTRUCTION    <====
                                                        ;          WHICH FOLLOWS W/ 744            <====
006616                          SNMB2D:
006616  012742  000161          MOV     #161,-(R2)      ;MOVE TO MAILBOX #  *******  161  *******
006622  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006624  000000                  HALT                    ;CC'S NOT CORRECT
006626  005300                  SNMB2E: DEC     R0
006630  005300                  DEC     R0
006632  001404                  BEQ     TS102
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;          CONDITIONAL BRANCH INST. AND    <====
                                                        ;          REPLACE THE MOVE INSTRUCTION    <====
                                                        ;          WHICH FOLLOWS W/ 735            <====
006634  012742  000162          MOV     #162,-(R2)      ;MOVE TO MAILBOX #  *******  162  *******
006640  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006642  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
                        ;****************************************************************************
006644  005212          TS102:  INC     (R2)            ;UPDATE TEST NUMBER
006646  022712  000102          CMP     #102,(R2)       ;SEQUENCE ERROR?
006652  001022                  BNE     TS103-10        ;BR TO ERROR HALT ON SEQ ERROR
006654  005000                  CLR     R0              ;R0=0
006656  005010                  CLR     (R0)            ;CLEAR LOC 0
006660  105100                  COMB    R0              ;R0=376
006662  005300                  DEC     R0
006664  000277                  SCC                     ;SET CC=1011
006666  000244                  CLZ
006670  005730                  TST     @(R0)+          ;TRY TST W/ MODE 3
006672  102403                  BVS     SNM3A           ;CHECK CC=0100
006674  103402                  BCS     SNM3A
006676  100401                  BMI     SNM3A
006700  001404                  BEQ     SNM3B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;          CONDITIONAL BRANCH INST. AND    <====
                                                        ;          REPLACE THE MOVE INSTRUCTION    <====
                                                        ;          WHICH FOLLOWS W/ 764            <====
006702                          SNM3A:
```

```
006702  012742  000163            MOV     #163,-(R2)      ;MOVE TO MAILBOX #  *******  163  *******
006706  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006710  000000                    HALT                    ;CC'S NOT CORRECT
006712  005300          SNM3B:    DEC     R0              ;R0=377
006714  105100                    COMB    R0              ;R0=0
006716  001404                    BEQ     TS103
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                          ;           WHICH FOLLOWS W/ 755            <====
006720  012742  000164            MOV     #164,-(R2)      ;MOVE TO MAILBOX #  *******  164  *******
006724  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006726  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.
                        ;*******************************************************************************
006730  005212          TS103:    INC     (R2)            ;UPDATE TEST NUMBER
006732  022712  000103            CMP     #103,(R2)       ;SEQUENCE ERROR?
006736  001036                    BNE     TS104-10        ;BR TO ERROR HALT ON SEQ ERROR
006740  005000                    CLR     R0              ;R0=0
006742  005010                    CLR     (R0)            ;CLEAR LOC 0
006744  105110                    COMB    (R0)            ;LOC. 0 =377
006746  105100                    COMB    R0
006750  005200                    INC     R0
006752  005720                    TST     (R0)+           ;R0=402
006754  000277                    SCC                     ;CC=0111
006756  000250                    CLN
006760  105730                    TSTB    @(R0)+          ;TRY TST OF EVEN BYTE
006762  102402                    BVS     SNMB3A          ;CHECK CC=1000
006764  101401                    BLOS    SNMB3A
006766  100404                    BMI     SNMB3B
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                          ;           WHICH FOLLOWS W/ 763            <====
006770                  SNMB3A:
006770  012742  000165            MOV     #165,-(R2)      ;MOVE TO MAILBOX #  *******  165  *******
006774  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006776  000000                    HALT                    ;CC'S NOT CORRECT
007000  000277          SNMB3B:   SCC                     ;SET CC=1011
007002  000244                    CLZ
007004  105730                    TSTB    @(R0)+          ;TRY TST OF ODD BYTE
007006  102403                    BVS     SNMB3C          ;CHECK CC=0100
007010  103402                    BCS     SNMB3C
007012  100401                    BMI     SNMB3C
```

```
007014  001404                  BEQ     SNMB3D
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 750              <====
007016                          SNMB3C:
007016  012742  000166          MOV     #166,-(R2)      ;MOVE TO MAILBOX #  *******  166  *******
007022  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007024  000000                  HALT                    ;CC'S NOT CORRECT
007026  005720          SNMB3D: TST     (R0)+           ;R0=410
007030  005710                  TST     (R0)
007032  100404                  BMI     TS104
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 741              <====
007034  012742  000167          MOV     #167,-(R2)      ;MOVE TO MAILBOX #  *******  167  *******
007040  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007042  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
                        ;*****************************************************************************
007044  005212          TS104:  INC     (R2)            ;UPDATE TEST NUMBER
007046  022712  000104          CMP     #104,(R2)       ;SEQUENCE ERROR?
007052  001017                  BNE     TS105-10        ;BR TO ERROR HALT ON SEQ ERROR
007054  005000                  CLR     R0              ;R0=0
007056  005010                  CLR     (R0)            ;LOC 0=0
007060  005120                  COM     (R0)+           ;LOC 0=-1
007062  000277                  SCC                     ;SET CC=1011
007064  000244                  CLZ
007066  005740                  TST     -(R0)           ;TRY TST W/ MODE 4
007070  102402                  BVS     SNM4A           ;CHECK CC=0100
007072  101401                  BLOS    SNM4A
007074  100404                  BMI     SNM4B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 766              <====
007076                          SNM4A:
007076  012742  000170          MOV     #170,-(R2)      ;MOVE TO MAILBOX #  *******  170  *******
007102  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007104  000000                  HALT                    ;CC'S NOT CORRECT
007106  005700          SNM4B:  TST     R0
007110  001404                  BEQ     TS105
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
```

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                                                            ;            WHICH FOLLOWS W/ 760            <====
007112  012742  000171          MOV     #171,-(R2)          ;MOVE TO MAILBOX #  *******  171  *******
007116  005242                  INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
007120  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
                        ;*******************************************************************************
007122  005212          TS105:  INC     (R2)                ;UPDATE TEST NUMBER
007124  022712  000105          CMP     #105,(R2)           ;SEQUENCE ERROR?
007130  001022                  BNE     TS106-10            ;BR TO ERROR HALT ON SEQ ERROR
007132  005000                  CLR     R0                  ;R0=0
007134  005010                  CLR     (R0)                ;LOC 0=0
007136  005110                  COM     (R0)                ;LOC 0=-1
007140  105100                  COMB    R0                  ;R0=377
007142  005200                  INC     R0                  ;R0=400
007144  000277                  SCC                         ;SET CC=0111
007146  000250                  CLN
007150  005750                  TST     @-(R0)              ;TRY TST W/ MODE 5
007152  102402                  BVS     SNM5A               ;CHECK CC=1000
007154  101401                  BLOS    SNM5A
007156  100404                  BMI     SNM5B
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 764            <====
007160                  SNM5A:
007160  012742  000172          MOV     #172,-(R2)          ;MOVE TO MAILBOX #  *******  172  *******
007164  005242                  INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
007166  000000                  HALT                        ;CC'S NOT SET PROPERLY
007170  005200          SNM5B:  INC     R0                  ;R0=377
007172  105100                  COMB    R0                  ;R0=0
007174  001404                  BEQ     TS106
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 755            <====
007176  012742  000173          MOV     #173,-(R2)          ;MOVE TO MAILBOX #  *******  173  *******
007202  005242                  INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
007204  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.
```

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                                 ;
                                 ;*******************************************************************************
                                 ;TEST 106        TEST MODE 6 W/ SOP NON-MODIFYING INSTS
                                 ;*******************************************************************************
007206  005212                   TS106:  INC     (R2)                   ;UPDATE TEST NUMBER
007210  022712  000106                   CMP     #106,(R2)              ;SEQUENCE ERROR?
007214  001021                           BNE     TS107-10               ;BR TO ERROR HALT ON SEQ ERROR
007216  005000                           CLR     R0                     ;R0=0
007220  005010                           CLR     (R0)                   ;LOC 0=0
007222  005110                           COM     (R0)                   ;LOC 0=-1
007224  105100                           COMB    R0                     ;R0=377
007226  000277                           SCC                            ;SET CC=0111
007230  000250                           CLN
007232  005760  177401                   TST     -377(R0)               ;TRY TST W/ MODE 6
007236  102402                           BVS     SNM6A                  ;CHECK CC=1000
007240  101401                           BLOS    SNM6A
007242  100404                           BMI     SNM6B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 764             <====
007244                           SNM6A:
007244  012742  000174                   MOV     #174,-(R2)             ;MOVE TO MAILBOX #  *******  174  *******
007250  005242                           INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
007252  000000                           HALT                           ;CC'S INCORRECT
007254  105100                   SNM6B:  COMB    R0                     ;R0=0
007256  001404                           BEQ     TS107
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 756             <====
007260  012742  000175                   MOV     #175,-(R2)             ;MOVE TO MAILBOX #  *******  175  *******
007264  005242                           INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
007266  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.
                                        ;*******************************************************************************
007270  005212                          TS107:  INC     (R2)            ;UPDATE TEST NUMBER
007272  022712  000107                          CMP     #107,(R2)       ;SEQUENCE ERROR?
007276  001021                                  BNE     TS110-10        ;BR TO ERROR HALT ON SEQ ERROR
007300  005000                                  CLR     R0              ;R0=0
007302  005010                                  CLR     (R0)            ;LOC 0=0
007304  005110                                  COM     (R0)            ;LOC 0=-1
007306  105100                                  COMB    R0              ;R0=377
007310  000277                                  SCC                     ;CC=0111
007312  000250                                  CLN
007314  005770  000001                          TST     @1(R0)          ;TRY TST W/ MODE 7
007320  102402                                  BVS     SNM7A           ;CHECK CC=1000
007322  101401                                  BLOS    SNM7A
007324  100404                                  BMI     SNM7B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 764             <====
007326                                  SNM7A:
007326  012742  000176                          MOV     #176,-(R2)      ;MOVE TO MAILBOX #  *******  176  *******
007332  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007334  000000                                  HALT                    ;CC'S NOT CORRECT
007336  105100                          SNM7B:  COMB    R0              ;R0=0
007340  001404                                  BEQ     TS110
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 756             <====
007342  012742  000177                          MOV     #177,-(R2)      ;MOVE TO MAILBOX #  *******  177  *******
007346  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007350  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.
                                  ;*************************************************************************
007352  005212                    TS110:  INC     (R2)            ;UPDATE TEST NUMBER
007354  022712  000110                    CMP     #110,(R2)       ;SEQUENCE ERROR?
007360  001006                            BNE     TS111-10        ;BR TO ERROR HALT ON SEQ ERROR
007362  005000                            CLR     R0              ;R0=0
007364  005100                            COM     R0              ;R0=-1
007366  005004                            CLR     R4              ;R4=0
007370  060004                            ADD     R0,R4           ;TRY ADD: R4=-1
007372  005204                            INC     R4              ;R4=0
007374  001404                            BEQ     TS111
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 771            <====
007376  012742  000200                    MOV     #200,-(R2)      ;MOVE TO MAILBOX #  *******  200  *******
007402  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007404  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
                                  ;*************************************************************************
007406  005212                    TS111:  INC     (R2)            ;UPDATE TEST NUMBER
007410  022712  000111                    CMP     #111,(R2)       ;SEQUENCE ERROR?
007414  001006                            BNE     TS112-10        ;BR TO ERROR HALT ON SEQ ERROR
007416  005000                            CLR     R0              ;R0=0
007420  005004                            CLR     R4              ;R4=0
007422  005100                            COM     R0              ;R0=-1
007424  010004                            MOV     R0,R4           ;TRY MOVE -1 TO R4
007426  005204                            INC     R4              ;INC R4
007430  001404                            BEQ     TS112
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 771            <====
007432  012742  000201                    MOV     #201,-(R2)      ;MOVE TO MAILBOX #  *******  201  *******
007436  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007440  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
                                  ;*******************************************************************************
007442  005212                    TS112:  INC     (R2)            ;UPDATE TEST NUMBER
007444  022712  000112                    CMP     #112,(R2)       ;SEQUENCE ERROR?
007450  001016                            BNE     TS113-10        ;BR TO ERROR HALT ON SEQ ERROR
007452  005000                            CLR     R0              ;R0=0
007454  005004                            CLR     R4              ;R4=0
007456  005204                            INC     R4              ;R4=1
007460  160400                            SUB     R4,R0           ;TRY SUB 0,0   R0=-1
007462  100003                            BPL     SUB0            ;CC=1001
007464  001402                            BEQ     SUB0
007466  102401                            BVS     SUB0
007470  103404                            BCS     SUB0A
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 767            <====
007472                            SUB0:
007472  012742  000202                    MOV     #202,-(R2)      ;MOVE TO MAILBOX #  *******  202  *******
007476  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007500  000000                            HALT                    ;CONDITION CODE FAILED ON SUB
007502  005200                    SUB0A:  INC     R0
007504  001404                            BEQ     TS113
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 761            <====
007506  012742  000203                    MOV     #203,-(R2)      ;MOVE TO MAILBOX #  *******  203  *******
007512  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007514  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
                                  ;*******************************************************************************
007516  005212                    TS113:  INC     (R2)            ;UPDATE TEST NUMBER
007520  022712  000113                    CMP     #113,(R2)       ;SEQUENCE ERROR?
007524  001051                            BNE     TS114-10        ;BR TO ERROR HALT ON SEQ ERROR
007526  005000                            CLR     R0              ;R0=0
007530  010004                            MOV     R0,R4           ;TRY MOVE MODE 0,0
007532  001404                            BEQ     DOP0A
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 774             <====
007534  012742  000204                    MOV     #204,-(R2)      ;MOVE TO MAILBOX #  *******  204  *******
007540  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007542  000000                            HALT                    ;Z-BIT NOT SET
007544  005200                    DOP0A:  INC     R0              ;R0=1
007546  005100                            COM     R0              ;R0=177776
007550  005104                            COM     R4              ;R4=177777
007552  040004                            BIC     R0,R4           ;TRY BIC: R4=1
007554  005304                            DEC     R4              ;R4=0
007556  001404                            BEQ     DOP0B
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 762             <====
007560  012742  000205                    MOV     #205,-(R2)      ;MOVE TO MAILBOX #  *******  205  *******
007564  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007566  000000                            HALT                    ;BIC CLEAR RESULT INCORRECT
007570  050004                    DOP0B:  BIS     R0,R4           ;TRY BIS: R4=177777
007572  005204                            INC     R4
007574  005204                            INC     R4              ;R4=0
007576  001404                            BEQ     DOP0C
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 752             <====
007600  012742  000206                    MOV     #206,-(R2)      ;MOVE TO MAILBOX #  *******  206  *******
007604  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007606  000000                            HALT                    ;RESULT OF BIS INCORRECT
007610  005000                    DOP0C:  CLR     R0              ;R0=0
007612  105100                            COMB    R0              ;R0=377
007614  005004                            CLR     R4              ;R4=0
007616  005104                            COM     R4              ;R4=177777
007620  040004                            BIC     R0,R4           ;R4=177400
007622  060004                            ADD     R0,R4           ;TRY ADD: R4=177777
007624  005204                            INC     R4              ;R4=0
```

```
007626  001404                    BEQ     DOPOD
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                          ;           WHICH FOLLOWS W/ 736            <====
007630  012742  000207            MOV     #207,-(R2)      ;MOVE TO MAILBOX #  *******  207  *******
007634  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007636  000000                    HALT                    ;RESULT OF ADD INCORRECT
007640  160004           DOPOD:   SUB     R0,R4           ;177401=R4
007642  105404                    NEGB    R4              ;R4=177777
007644  005204                    INC     R4              ;RD=0
007646  001404                    BEQ     TS114
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                          ;           WHICH FOLLOWS W/ 726            <====
007650  012742  000210            MOV     #210,-(R2)      ;MOVE TO MAILBOX #  *******  210  *******
007654  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007656  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
                              ;*************************************************************************
007660  005212                TS114:  INC     (R2)            ;UPDATE TEST NUMBER
007662  022712  000114                CMP     #114,(R2)       ;SEQUENCE ERROR?
007666  001024                        BNE     TS115-10        ;BR TO ERROR HALT ON SEQ ERROR
007670  005000                        CLR     R0              ;R0=0
007672  005010                        CLR     (R0)            ;LOC. 0=0
007674  105110                        COMB    (R0)            ;LOC. 0=377
007676  005220                        INC     (R0)+           ;LOC. 0=400   R0=2
007700  005400                        NEG     R0              ;R0=-2
007702  060037  000000                ADD     R0,@#0          ;TRY ADD 0,3;  LOC. 0=376
007706  100403                        BMI     DOP03A          ;CC=0001?
007710  001402                        BEQ     DOP03A
007712  102401                        BVS     DOP03A
007714  103404                        BCS     DOP03B
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                              ;           CONDITIONAL BRANCH INST. AND     <====
                                                              ;           REPLACE THE MOVE INSTRUCTION     <====
                                                              ;           WHICH FOLLOWS W/ 764             <====
007716                        DOP03A:
007716  012742  000211                MOV     #211,-(R2)      ;MOVE TO MAILBOX #  *******  211  *******
007722  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007724  000000                        HALT                    ;CC'S NOT SET CORRECTLY
007726  105137  000000        DOP03B: COMB    @#0             ;LOC. 0=1
007732  005337  000000                DEC     @#0             ;LOC. 0=0
007736  001404                        BEQ     TS115
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                              ;           CONDITIONAL BRANCH INST. AND     <====
                                                              ;           REPLACE THE MOVE INSTRUCTION     <====
                                                              ;           WHICH FOLLOWS W/ 753             <====
007740  012742  000212                MOV     #212,-(R2)      ;MOVE TO MAILBOX #  *******  212  *******
007744  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007746  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
                                ;*******************************************************************************
007750  005212                  TS115:  INC     (R2)            ;UPDATE TEST NUMBER
007752  022712  000115                  CMP     #115,(R2)       ;SEQUENCE ERROR?
007756  001042                          BNE     TS116-10        ;BR TO ERROR HALT ON SEQ ERROR
007760  005000                          CLR     R0              ;R0=0
007762  005004                          CLR     R4              ;R4=0
007764  005204                          INC     R4              ;R4=1
007766  020400                          CMP     R4,R0           ;TRY COMPARE R4 TO R0
007770  003004                          BGT     DNM1
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 772           <====
007772  012742  000213                  MOV     #213,-(R2)      ;MOVE TO MAILBOX #  *******  213  *******
007776  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010000  000000                          HALT                    ;CC'S NOT CORRECT FOR CMP
010002  020004                  DNM1:   CMP     R0,R4           ;TRY COMPARE R0 TO R4
010004  002404                          BLT     DNM2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 764           <====
010006  012742  000214                  MOV     #214,-(R2)      ;MOVE TO MAILBOX #  *******  214  *******
010012  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010014  000000                          HALT                    ;CC'S NOT CORRECT FOR CMP
010016  005200                  DNM2:   INC     R0              ;R0=1
010020  020400                          CMP     R4,R0           ;TRY COMPARE R4=1 TO R0=1
010022  001404                          BEQ     DNM3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 755           <====
010024  012742  000215                  MOV     #215,-(R2)      ;MOVE TO MAILBOX #  *******  215  *******
010030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010032  000000                          HALT                    ;CC'S NOT CORRECT (Z=1) FOR CMP
010034  005000                  DNM3:   CLR     R0              ;R0=0
010036  005100                          COM     R0              ;R0=177777
010040  005004                          CLR     R4              ;R4=0
010042  030004                          BIT     R0,R4           ;TRY BIT R0 TO R4
010044  001404                          BEQ     DNM4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 744           <====
010046  012742  000216                  MOV     #216,-(R2)      ;MOVE TO MAILBOX #  *******  216  *******
010052  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010054  000000                          HALT                    ;CC'S NOT CORRECT FOR BIT
010056  005304                  DNM4:   DEC     R4              ;R4=177777
```

```
010060 030004                 BIT     R0,R4          ;TRY BIT AGAIN
010062 100404                 BMI     TS116
                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                     ;           WHICH FOLLOWS W/ 735            <====
010064 012742 000217          MOV     #217,-(R2)     ;MOVE TO MAILBOX #  *******  217  *******
010070 005242                 INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
010072 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.
                      ;*******************************************************************************
010074 005212         TS116:  INC     (R2)           ;UPDATE TEST NUMBER
010076 022712 000116          CMP     #116,(R2)      ;SEQUENCE ERROR?
010102 001022                 BNE     TS117-10       ;BR TO ERROR HALT ON SEQ ERROR
010104 005000                 CLR     R0             ;R0=0
010106 005010                 CLR     (R0)           ;LOC. 0=0
010110 005110                 COM     (R0)           ;LOC. 0=177777
010112 005200                 INC     R0             ;R0=1
010114 020037 000000          CMP     R0,@#0         ;TRY CMP MODE 0,3
010120 100403                 BMI     DNM03A         ;CC=0001
010122 001402                 BEQ     DNM03A
010124 102401                 BVS     DNM03A
010126 103404                 BCS     DNM03B
                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                     ;           WHICH FOLLOWS W/ 765            <====
010130                DNM03A:
010130 012742 000220          MOV     #220,-(R2)     ;MOVE TO MAILBOX #  *******  220  *******
010134 005242                 INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
010136 000000                 HALT                   ;CC'S NOT SET CORRECTLY
010140 005300         DNM03B: DEC     R0
010142 001002                 BNE     DNM03C
010144 005210                 INC     (R0)
010146 001404                 BEQ     TS117
                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                     ;           WHICH FOLLOWS W/ 755            <====
010150                DNM03C:
010150 012742 000221          MOV     #221,-(R2)     ;MOVE TO MAILBOX #  *******  221  *******
010154 005242                 INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
010156 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.
                              ;*************************************************************************
010160  005212                TS117:  INC     (R2)            ;UPDATE TEST NUMBER
010162  022712  000117                CMP     #117,(R2)       ;SEQUENCE ERROR?
010166  001007                        BNE     TS120-10        ;BR TO ERROR HALT ON SEQ ERROR
010170  005000                        CLR     R0              ;R0=0
010172  005100                        COM     R0              ;R0=177777
010174  005004                        CLR     R4              ;R4=0
010176  005014                        CLR     (R4)            ;LOC 0=0
010200  005214                        INC     (R4)            ;LOC 0=1
010202  061400                        ADD     (R4),R0         ;TRY ADD SOURCE MODE 1
010204  001404                        BEQ     TS120
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND   <====
                                                              ;           REPLACE THE MOVE INSTRUCTION   <====
                                                              ;           WHICH FOLLOWS W/ 770           <====
010206  012742  000222                MOV     #222,-(R2)      ;MOVE TO MAILBOX #  *******  222  *******
010212  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010214  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.
                                                ;*******************************************************************************
010216  005212                                  TS120:  INC     (R2)            ;UPDATE TEST NUMBER
010220  022712  000120                                  CMP     #120,(R2)       ;SEQUENCE ERROR?
010224  001007                                          BNE     TS121-10        ;BR TO ERROR HALT ON SEQ ERROR
010226  005000                                          CLR     R0              ;R0=0
010230  005010                                          CLR     (R0)            ;LOC. 0=0
010232  005110                                          COM     (R0)            ;LOC. 0=177777
010234  005004                                          CLR     R4              ;R4=0
010236  151004                                          BISB    (R0),R4         ;TRY MODE 1- EVEN BYTE W/ DOP
010240  105104                                          COMB    R4              ;R4=0
010242  001404                                          BEQ     TS121
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 770             <====
010244  012742  000223                                  MOV     #223,-(R2)      ;MOVE TO MAILBOX #  *******  223  *******
010250  005242                                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010252  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 RO 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.
                                    ;*******************************************************************************
010254  005212                      TS121:  INC     (R2)            ;UPDATE TEST NUMBER
010256  022712  000121                      CMP     #121,(R2)       ;SEQUENCE ERROR?
010262  001007                              BNE     TS122-10        ;BR TO ERROR HALT ON SEQ ERROR
010264  005000                              CLR     R0              ;R0=0
010266  005010                              CLR     (R0)            ;LOC 0=0
010270  005110                              COM     (R0)            ;LOC 0=177777
010272  005004                              CLR     R4              ;R4=0
010274  105104                              COMB    R4              ;R4=377
010276  121004                              CMPB    (R0),R4         ;TRY MODE 1 - EVEN BYTE W/ DOP NON-MODIFYING
010300  001404                              BEQ     TS122
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 770            <====
010302  012742  000224                      MOV     #224,-(R2)      ;MOVE TO MAILBOX #  *******  224  *******
010306  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010310  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
                                        ;*************************************************************************
 010312 005212                          TS122:  INC     (R2)            ;UPDATE TEST NUMBER
 010314 022712 000122                           CMP     #122,(R2)       ;SEQUENCE ERROR?
 010320 001020                                  BNE     TS123-10        ;BR TO ERROR HALT ON SEQ ERROR
 010322 005000                                  CLR     R0              ;R0=0
 010324 005010                                  CLR     (R0)            ;LOC 0=0
 010326 105110                                  COMB    (R0)            ;LOC 0=177400
 010330 005110                                  COM     (R0)
 010332 005004                                  CLR     R4              ;R4=0
 010334 005104                                  COM     R4              ;R4=177777
 010336 111004                                  MOVB    (R0),R4         ;R4=0
 010340 005704                                  TST     R4              ;CHECK SIGN OF WORD
 010342 001404                                  BEQ     DOP1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
 010344 012742 000225                           MOV     #225,-(R2)      ;MOVE TO MAILBOX #  *******  225  *******
 010350 005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 010352 000000                                  HALT                    ;MOVB SHOULD SIGN X-TEND
 010354 005110                          DOP1:   COM     (R0)            ;LOC 0=177777
 010356 111004                                  MOVB    (R0),R4         ;DO MOVB W/ EVEN BYTE
 010360 100404                                  BMI     TS123
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 757           <====
 010362 012742 000226                           MOV     #226,-(R2)      ;MOVE TO MAILBOX #  *******  226  *******
 010366 005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 010370 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.
                                      ;*************************************************************************
010372  005212                        TS123:  INC     (R2)            ;UPDATE TEST NUMBER
010374  022712  000123                        CMP     #123,(R2)       ;SEQUENCE ERROR?
010400  001010                                BNE     TS124-10        ;BR TO ERROR HALT ON SEQ ERROR
010402  005000                                CLR     R0              ;R0=0
010404  005010                                CLR     (R0)            ;LOC. 0=0
010406  005004                                CLR     R4              ;R4=0
010410  005204                                INC     R4              ;R4=1
010412  105114                                COMB    (R4)            ;LOC. 0=177400
010414  151410                                BISB    (R4),(R0)       ;TRY TO BIS LOW ORDER BITS W/ MODE 1
010416  005210                                INC     (R0)            ;CHECK RESULT
010420  001404                                BEQ     TS124
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                      ;           WHICH FOLLOWS W/ 767             <====
010422  012742  000227                        MOV     #227,-(R2)      ;MOVE TO MAILBOX #  *******  227  *******
010426  005242                                INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010430  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.
                                   ;*******************************************************************************
010432  005212                     TS124:  INC     (R2)            ;UPDATE TEST NUMBER
010434  022712  000124                     CMP     #124,(R2)       ;SEQUENCE ERROR?
010440  001015                             BNE     TS125-10        ;BR TO ERROR HALT ON SEQ ERROR
010442  005000                             CLR     R0              ;R0=0
010444  005010                             CLR     (R0)            ;LOC. 0=0
010446  005110                             COM     (R0)            ;LOC. 0=177777
010450  012004                             MOV     (R0)+,R4        ;TRY MOVE MODE 2,0
010452  005204                             INC     R4              ;CHECK R4
010454  001404                             BEQ     DOP2
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 771             <====
010456  012742  000230                     MOV     #230,-(R2)      ;MOVE TO MAILBOX #  *******  230  *******
010462  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010464  000000                             HALT                    ;RESULT OF MOV INST INCORRECT
010466  005300                     DOP2:   DEC     R0              ;TEST R0 AFTER MODE 2
010470  005300                             DEC     R0
010472  001404                             BEQ     TS125
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 762             <====
010474  012742  000231                     MOV     #231,-(R2)      ;MOVE TO MAILBOX #  *******  231  *******
010500  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010502  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.
                                        ;*************************************************************************
010504  005212                          TS125:  INC     (R2)            ;UPDATE TEST NUMBER
010506  022712  000125                          CMP     #125,(R2)       ;SEQUENCE ERROR?
010512  001016                                  BNE     TS126-10        ;BR TO ERROR HALT ON SEQ ERROR
010514  005000                                  CLR     R0              ;R0=0
010516  010010                                  MOV     R0,(R0)         ;LOC. 0=0
010520  005110                                  COM     (R0)            ;LOC. 0=177777
010522  142010                                  BICB    (R0)+,(R0)      ;TRY TO CLEAR BYTE 1 FROM BYTE 0 W/ BICB
010524  105737  000001                          TSTB    @#1             ;CHECK RESULT
010530  001404                                  BEQ     DOPB2A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 770            <====
010532  012742  000232                          MOV     #232,-(R2)      ;MOVE TO MAILBOX #  *******  232  *******
010536  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010540  000000                                  HALT                    ;BICB DESTINATION INCORRECT
010542  105137  000000                  DOPB2A: COMB    @#0             ;CHECK BICB SOURCE
010546  001404                                  BEQ     TS126
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 761            <====
010550  012742  000233                          MOV     #233,-(R2)      ;MOVE TO MAILBOX #  *******  233  *******
010554  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010556  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.
                                        ;*******************************************************************************
010560  005212                          TS126:  INC     (R2)            ;UPDATE TEST NUMBER
010562  022712  000126                          CMP     #126,(R2)       ;SEQUENCE ERROR?
010566  001017                                  BNE     TS127-10        ;BR TO ERROR HALT ON SEQ ERROR
010570  005000                                  CLR     R0              ;R0=0
010572  005004                                  CLR     R4              ;R4=0
010574  005010                                  CLR     (R0)            ;LOC. 0=0
010576  005110                                  COM     (R0)            ;LOC. 0=177777
010600  105120                                  COMB    (R0)+           ;LOC 0=177400; R0=1
010602  112004                                  MOVB    (R0)+,R4        ;TRY DOP MODE 2 W/ ODD BYTE
010604  005204                                  INC     R4              ;CHECK RESULT OF MOVB
010606  001404                                  BEQ     DOPB2B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 767             <====
010610  012742  000234                          MOV     #234,-(R2)      ;MOVE TO MAILBOX #  *******  234  *******
010614  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010616  000000                                  HALT                    ;RESULT OF MOVB INCORRECT
010620  005740                          DOPB2B: TST     -(R0)           ;BUMP R0 DOWN BY 2
010622  005700                                  TST     R0              ;CHECK R0
010624  001404                                  BEQ     TS127
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 760             <====
010626  012742  000235                          MOV     #235,-(R2)      ;MOVE TO MAILBOX #  *******  235  *******
010632  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010634  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.
                                        ;*************************************************************************************
 010636  005212                         TS127:  INC     (R2)            ;UPDATE TEST NUMBER
 010640  022712  000127                         CMP     #127,(R2)       ;SEQUENCE ERROR?
 010644  001011                                 BNE     TS130-10        ;BR TO ERROR HALT ON SEQ ERROR
 010646  012737  052525  000000                 MOV     #052525,@#0     ;MOVE 52525 TO LOC. 0
 010654  012700  125252                         MOV     #125252,R0      ;SET ALT. ONE AND ZERO IN R0
 010660  053700  000000                         BIS     @#0,R0          ;TRY TO SET ALL OTHER BITS W/ MODE 3
 010664  005200                                 INC     R0              ;TEST RESULT
 010666  001404                                 BEQ     TS130
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
 010670  012742  000236                         MOV     #236,-(R2)      ;MOVE TO MAILBOX #  *******  236  *******
 010674  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 010676  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.
                                        ;*************************************************************************************
 010700  005212                         TS130:  INC     (R2)            ;UPDATE TEST NUMBER
 010702  022712  000130                         CMP     #130,(R2)       ;SEQUENCE ERROR?
 010706  001011                                 BNE     TS131-10        ;BR TO ERROR HALT ON SEQ ERROR
 010710  012737  052652  000000                 MOV     #52652,@#0      ;NOVE 1'S AND 0' PATTERN TO LOC. 0
 010716  005000                                 CLR     R0              ;R0=0
 010720  153700  000000                         BISB    @#0,R0          ;TRY R0=252 W/ MODE 3 - EVEN BYTE
 010724  022700  000252                         CMP     #252,R0         ;BISB W/ EVEN BYTE SUCCESSFUL?
 010730  001404                                 BEQ     TS131
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
 010732  012742  000237                         MOV     #237,-(R2)      ;MOVE TO MAILBOX #  *******  237  *******
 010736  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 010740  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.
                                        ;*************************************************************************
010742  005212                          TS131:  INC     (R2)            ;UPDATE TEST NUMBER
010744  022712  000131                          CMP     #131,(R2)       ;SEQUENCE ERROR?
010750  001011                                  BNE     TS132-10        ;BR TO ERROR HALT ON SEQ ERROR
010752  012737  052652  000000                  MOV     #52652,@#0      ;MOVE 1'S AND 0'S PATTERN TO LOC 0
010760  005000                                  CLR     R0              ;R0=0
010762  153700  000001                          BISB    @#1,R0          ;TRY R0=152 W/ MODE 3 - ODD BYTE
010766  022700  000125                          CMP     #125,R0         ;R0=125?
010772  001404                                  BEQ     TS132
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 766             <====
010774  012742  000240                          MOV     #240,-(R2)      ;MOVE TO MAILBOX #  *******  240  *******
011000  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011002  000000                                  HALT                    ;BISB W/ MODE 3 - ODD BYTE FAILED
                                                                        ;  OR SEQUENCE ERROR


                                        ;*************************************************************************
                                        ;TEST 132        TEST DEST. MODE 0-BYTE W/ DOP NON-MODIFYING MST
                                        ;*************************************************************************
011004  005212                          TS132:  INC     (R2)            ;UPDATE TEST NUMBER
011006  022712  000132                          CMP     #132,(R2)       ;SEQUENCE ERROR?
011012  001017                                  BNE     TS133-10        ;BR TO ERROR HALT ON SEQ ERROR
011014  005000                                  CLR     R0              ;R0=0
011016  105100                                  COMB    R0              ;R0=377
011020  000263                                  +SEC!SEV                ;SET C AND V BITS
011022  132700  000200                          BITB    #200,R0         ;TRY DOPNM DEST. MODE 0-BYTE
011026  001403                                  BEQ     DNMB0A          ;BR TO ERROR IF Z BIT SET
011030  102402                                  BVS     DNMB0A          ;BR TO ERROR IF V BIT SET
011032  103001                                  BCC     DNMB0A          ;BR TO ERROR IF C BIT CLEAR.
011034  100404                                  BMI     DNMB0B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 766             <====
011036                                  DNMB0A:
011036  012742  000241                          MOV     #241,-(R2)      ;MOVE TO MAILBOX #  *******  241  *******
011042  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011044  000000                                  HALT                    ;CC'S INCORRECT
011046  105100                          DNMB0B: COMB    R0              ;CHECK DESTINATION DATA
011050  001404                                  BEQ     TS133
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 760             <====
011052  012742  000242                          MOV     #242,-(R2)      ;MOVE TO MAILBOX #  *******  242  *******
```

```
011056  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011060  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 133        TEST DEST. MODE 1 W/ DOP NON-MODIFYING INST
                                ;*******************************************************************************
011062  005212                  TS133:  INC     (R2)            ;UPDATE TEST NUMBER
011064  022712  000133                  CMP     #133,(R2)       ;SEQUENCE ERROR?
011070  001017                          BNE     TS134-10        ;BR TO ERROR HALT ON SEQ ERROR
011072  005000                          CLR     R0              ;R0=0
011074  005010                          CLR     (R0)            ;LOC. 0=0
011076  000241                          CLC                     ;CLEAR C BIT
011100  032710  177777                  BIT     #177777,(R0)    ;TRY DOPNM DEST. MODE 1
011104  100403                          BMI     DNM1A           ;BR TO ERROR IF N BIT SET
011106  102402                          BVS     DNM1A           ;BR TO FRROR IF V BIT SET
011110  103401                          BCS     DNM1A           ;BR TO ERROR IF C BIT SET
011112  001404                          BEQ     DNM1B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
011114                          DNM1A:
011114  012742  000243                  MOV     #243,-(R2)      ;MOVE TO MAILBOX #  *******  243  *******
011120  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011122  000000                          HALT                    ;COND. CODES INCORRECT
011124  005710                  DNM1B:  TST     (R0)            ;CHECK TEST DATA
011126  001404                          BEQ     TS134
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 760            <====
011130  012742  000244                  MOV     #244,-(R2)      ;MOVE TO MAILBOX #  *******  244  *******
011134  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011136  000000                          HALT                    ;DESTINATION DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 134        TEST DEST, MODE 2 W/ DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011140  005212                  TS134:  INC     (R2)            ;UPDATE TEST NUMBER
011142  022712  000134                  CMP     #134,(R2)       ;SEQUENCE ERROR?
011146  001027                          BNE     TS135-10        ;BR TO ERROR HALT ON SEQ ERROR
011150  005000                          CLR     R0              ;R0=0
011152  005010                          CLR     (R0)            ;LOC. 0=0
011154  052710  125252                  BIS     #125252,(R0)    ;LOC. 0=125252
011160  032720  077777                  BIT     #77777,(R0)+    ;TRY DOPNM INST W/ MODE 2
011164  102402                          BVS     DNM2A           ;BR TO ERROR IF V BIT SET
011166  001401                          BEQ     DNM2A           ;BR TO ERROR IF Z-BIT SET
011170  100004                          BPL     DNM2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
011172                          DNM2A:
011172  012742  000245                  MOV     #245,-(R2)      ;MOVE TO MAILBOX #  *******  245  *******
```

```
011176  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011200  000000                          HALT                    ;COND. CODES INCORRECT
011202  005300                  DNM2B:  DEC     R0              ;DECREMENT R0 TO CHECK IT.
011204  005300                          DEC     R0
011206  001404                          BEQ     DNM2D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 757             <====
011210                          DNM2C:
011210  012742  000246                  MOV     #246,-(R2)      ;MOVE TO MAILBOX #  *******  246  *******
011214  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011216  000000                          HALT                    ;MODE 2 REGISTER NOT INCREMENTED BY 2
011220  022710  125252          DNM2D:  CMP     #125252,(R0)    ;CHECK DEST. DATA
011224  001404                          BEQ     TS135
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 750             <====
011226  012742  000247                  MOV     #247,-(R2)      ;MOVE TO MAILBOX #  *******  247  *******
011232  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011234  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 135       TEST DEST. MODE 2-BYTE, W/DOP NON-MODIFYING INST
                                ;*******************************************************************************
011236  005212                  TS135:  INC     (R2)            ;UPDATE TEST NUMBER
011240  022712  000135                  CMP     #135,(R2)       ;SEQUENCE ERROR?
011244  001051                          BNE     TS136-10        ;BR TO ERROR HALT ON SEQ ERROR
011246  005000                          CLR     R0              ;R0=0
011250  005010                          CLR     (R0)            ;LOC. 0=0
011252  052710  052652                  BIS     #52652,(R0)     ;LOC. 0=52652
011256  000263                          +SEC!SEV                ;SET C AND V BITS
011260  132720  000201                  BITB    #201,(R0)+      ;TRY DOPNM INST. W/ MODE 2 EVEN BYTE
011264  001403                          BEQ     DNMB2A          ;BR TO ERROR IF Z-BIT SET
011266  103002                          BCC     DNMB2A          ;BR TO ERROR IF C-BIT CLEAR
011270  102401                          BVS     DNMB2A          ;BR TO ERROR IF V-BIT SET
011272  100404                          BMI     DNMB2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 764             <====
011274                          DNMB2A:
011274  012742  000250                  MOV     #250,-(R2)      ;MOVE TO MAILBOX #  *******  250  *******
011300  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011302  000000                          HALT                    ;COND. CODES INCORRECT
011304  005300                  DNMB2B: DEC     R0              ;CHECK DEST. REGISTER.
011306  001404                          BEQ     DNMB2C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 756             <====
011310  012742  000251                  MOV     #251,-(R2)      ;MOVE TO MAILBOX #  *******  251  *******
011314  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011316  000000                          HALT                    ;DEST. REGISTER NOT INCREMENTED BY 1
```

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011320  005200                  DNMB2C: INC     R0                      ;R0=1
011322  132720  000201                  BITB    #201,(R0)+              ;TRY DOPNM INST. W/MODE 2-ODD BYTE
011326  001402                          BEQ     DNMB2D  ;BR TO ERROR IF Z-BIT SET
011330  102401                          BVS     DNMB2D                  ;BR TO ERROR IF V-BIT SET
011332  100004                          BPL     DNMB2E
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
011334                                  DNMB2D:
011334  012742  000252                  MOV     #252,-(R2)              ;MOVE TO MAILBOX #  *******  252  *******
011340  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011342  000000                          HALT                            ;COND. CODES INCORRECT
011344  005300                  DNMB2E: DEC     R0                      ;DEC R0 TO CHECK IT.
011346  005300                          DEC     R0
011350  001404                          BEQ     DNMB2F
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 735            <====
011352  012742  000253                  MOV     #253,-(R2)              ;MOVE TO MAILBOX #  *******  253  *******
011356  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011360  000000                          HALT                            ;DEST. REGISTER NOT INCREMENTED BY 1
011362  022710  052652          DNMB2F: CMP     #52652,(R0)             ;CHECK DEST. DATA IS UNMODIFIED
011366  001404                          BEQ     TS136
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 726            <====
011370  012742  000254                  MOV     #254,-(R2)              ;MOVE TO MAILBOX #  *******  254  *******
011374  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011376  000000                          HALT                            ;DEST. DATA WAS MODIFIED.
                                                                        ;  OR SEQUENCE ERROR



                                ;*******************************************************************************
                                ;TEST 136        TEST DEST. MODE 3-BYTES W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011400  005212                  TS136:  INC     (R2)                    ;UPDATE TEST NUMBER
011402  022712  000136                  CMP     #136,(R2)               ;SEQUENCE ERROR?
011406  001050                          BNE     TS137-10                ;BR TO ERROR HALT ON SEQ ERROR
011410  005000                          CLR     R0                      ;R0=0
011412  005010                          CLR     (R0)                    ;LOC. 0=0
011414  052710  125125                  BIS     #125125,(R0)            ;LOC. 0=125125
011420  105100                          COMB    R0                      ;R0=377
011422  005200                          INC     R0                      ;R0=400
011424  005010                          CLR     (R0)                    ;LOC. 400=0
011426  000263                          +SEC!SEV                        ;C-BIT=V-BIT=1
011430  132730  000201                  BITB    #201,@(R0)+             ;TRY DOPNM W/MODE 3-EVEN BYTE
011434  001403                          BEQ     DNMB3A                  ;BR TO ERROR IF Z BIT SET
011436  102402                          BVS     DNMB3A                  ;BR TO ERROR IF V BIT SET
011440  103001                          BCC     DNMB3A                  ;BR TO ERROR IF C BIT CLEAR
011442  100004                          BPL     DNMB3B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
```

```
                                                          ;               WHICH FOLLOWS W/ 761            <====
011444                        DNMB3A:
011444  012742  000255                 MOV     #255,-(R2)         ;MOVE TO MAILBOX #  *******  255  *******
011450  005242                         INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
011452  000000                         HALT                       ;COND. CODES INCORRECT
011454  022700  000402        DNMB3B:  CMP     #402,R0            ;CHECK DEST. REGISTER INC. BY 2 AND INC BY 2 AGAIN
011460  001404                         BEQ     DNMB3C
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                          ;           CONDITIONAL BRANCH INST. AND        <====
                                                          ;           REPLACE THE MOVE INSTRUCTION        <====
                                                          ;           WHICH FOLLOWS W/ 752                <====
011462  012742  000256                 MOV     #256,-(R2)         ;MOVE TO MAILBOX #  *******  256  *******
011466  005242                         INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
011470  000000                         HALT                       ;DEST. REGISTER NOT INCREMENTED BY 2
011472  005200                DNMB3C:  INC     R0                 ;R0=404
011474  005200                         INC     R0
011476  132730  000201                 BITB    #201,@(R0)+        ;TRY DOPNM DEST MODE 3-BYTE(ODD)
011502  001402                         BEQ     DNMB3D             ;BR TO ERROR IF Z BIT SET
011504  102401                         BVS     DNMB3D             ;BR TO ERROR IF V BIT SET
011506  100404                         BMI     DNMB3E
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                          ;           CONDITIONAL BRANCH INST. AND        <====
                                                          ;           REPLACE THE MOVE INSTRUCTION        <====
                                                          ;           WHICH FOLLOWS W/ 737                <====
011510                        DNMB3D:
011510  012742  000257                 MOV     #257,-(R2)         ;MOVE TO MAILBOX #  *******  257  *******
011514  005242                         INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
011516  000000                         HALT                       ;COND. CODES INCORRECT
011520  005004                DNMB3E:  CLR     R4                 ;R4=0
011522  022714  125125                 CMP     #125125,(R4)       ;CHECK DEST. DATA
011526  001404                         BEQ     TS137
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                          ;           CONDITIONAL BRANCH INST. AND        <====
                                                          ;           REPLACE THE MOVE INSTRUCTION        <====
                                                          ;           WHICH FOLLOWS W/ 727                <====
011530  012742  000260                 MOV     #260,-(R2)         ;MOVE TO MAILBOX #  *******  260  *******
011534  005242                         INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
011536  000000                         HALT                       ;DEST. DATA MODIFIED
                                                          ;  OR SEQUENCE ERROR

                              ;*******************************************************************************
                              ;TEST 137         TEST DEST. MODE 4 W/DOP NON-MODIFYING INST.
                              ;*******************************************************************************
011540  005212                TS137:   INC     (R2)               ;UPDATE TEST NUMBER
011542  022712  000137                 CMP     #137,(R2)          ;SEQUENCE ERROR?
011546  001033                         BNE     TS140-10           ;BR TO ERROR HALT ON SEQ ERROR
011550  005000                         CLR     R0                 ;R0=0
011552  005010                         CLR     (R0)               ;LOC. 0=0
011554  052710  125252                 BIS     #125252,(R0)       ;LOC. 0=125125
011560  052700  000002                 BIS     #2,R0              ;R0=2
011564  000277                         SCC                        ;SET ALL COND. CODE BITS
011566  032740  020000                 BIT     #20000,-(R0)       ;TRY DOPNM W/ MODE 4
011572  100403                         BMI     DNM4A              ;BR TO ERROR IF N-BIT SET
011574  102402                         BVS     DNM4A              ;BR TO ERROR IF V-BIT SET
011576  103001                         BCC     DNM4A              ;BR TO ERROR IF C-BIT CHAR
011600  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           <====
011602                          DNM4A:
011602  012742  000261                  MOV     #261,-(R2)    ;MOVE TO MAILBOX #  *******  261  *******
011606  005242                          INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
011610  000000                          HALT                  ;COND. CODES INCORRECT
011612  005700                  DNM4B:  TST     R0            ;CHECK DEST. REGISTER
011614  001404                          BEQ     DNM4C
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND   <====
                                                              ;           REPLACE THE MOVE INSTRUCTION   <====
                                                              ;           WHICH FOLLOWS W/ 754           <====
011616  012742  000262                  MOV     #262,-(R2)    ;MOVE TO MAILBOX #  *******  262  *******
011622  005242                          INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
011624  000000                          HALT                  ;DEST. REGISTER NOT DECREMENTED BY 2
011626  022737  125252  000000  DNM4C:  CMP     #125252,@#0   ;CHECK DEST. DATA
011634  001404                          BEQ     TS140
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND   <====
                                                              ;           REPLACE THE MOVE INSTRUCTION   <====
                                                              ;           WHICH FOLLOWS W/ 744           <====
011636  012742  000263                  MOV     #263,-(R2)    ;MOVE TO MAILBOX #  *******  263  *******
011642  005242                          INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
011644  000000                          HALT                  ;DEST. DATA MODIFIED
                                                              ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 140       TEST DEST. MODE 4-BYTE W/ DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011646  005212                  TS140:  INC     (R2)          ;UPDATE TEST NUMBER
011650  022712  000140                  CMP     #140,(R2)     ;SEQUENCE ERROR?
011654  001051                          BNE     TS141-10      ;BR TO ERROR HALT ON SEQ ERROR
011656  005000                          CLR     R0            ;R0=0
011660  005010                          CLR     (R0)          ;LOC. 0=0
011662  052710  052652                  BIS     #52652,(R0)   ;LOC. 0=52652
011666  052700  000002                  BIS     #2,R0         ;R0=2
011672  000257                          CCC                   ;COND. CODES=0
011674  132740  000201                  BITB    #201,-(R0)    ;TRY DOPNM INST W/MODE 4 ODD BYTE
011700  102403                          BVS     DNMB4A        ;BR TO ERROR IF V BIT SET
011702  001402                          BEQ     DNMB4A  ;BR TO ERROR IF Z BIT SET
011704  103401                          BCS     DNMB4A        ;BR TO ERROR IF C BIT SET
011706  001004                          BNE     DNMB4B
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND   <====
                                                              ;           REPLACE THE MOVE INSTRUCTION   <====
                                                              ;           WHICH FOLLOWS W/ 762           <====
011710                          DNMB4A:
011710  012742  000264                  MOV     #264,-(R2)    ;MOVE TO MAILBOX #  *******  264  *******
011714  005242                          INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
011716  000000                          HALT                  ;COND. CODES INCORRECT
011720  022700  000001          DNMB4B: CMP     #1,R0         ;CHECK DEST. REGISTER
011724  001404                          BEQ     DNMB4C
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND   <====
```

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                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 753            <====
011726  012742  000265                  MOV     #265,-(R2)      ;MOVE TO MAILBOX #  *******  265  *******
011732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011734  000000                          HALT                    ;DEST REG. NOT DECREMENTED BY 1
011736  132740  000201          DNMB4C: BITB    #201,-(R0)      ;TRY DOPNM INST. W/MODE 4 EVEN BYTE
011742  001401                          BEQ     DNMB4D          ;BR TO ERROR IF Z-BIT SET
011744  100404                          BMI     DNMB4E
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 743            <====
011746                                  DNMB4D:
011746  012742  000266                  MOV     #266,-(R2)      ;MOVE TO MAILBOX #  *******  266  *******
011752  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011754  000000                          HALT                    ;COND. CODES INCORRECT
011756  005700                  DNMB4E: TST     R0              ;CHECK DEST. REGISTER
011760  001404                          BEQ     DNMB4F
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 735            <====
011762  012742  000267                  MOV     #267,-(R2)      ;MOVE TO MAILBOX #  *******  267  *******
011766  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011770  000000                          HALT                    ;DEST. REG. NOT DECREMENTED BY 1
011772  022710  052652          DNMB4F: CMP     #52652,(R0)     ;CHECK DESTINATION DATA
011776  001404                          BEQ     TS141
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 726            <====
012000  012742  000270                  MOV     #270,-(R2)      ;MOVE TO MAILBOX #  *******  270  *******
012004  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012006  000000                          HALT                    ;DEST. DATA MODIFIED
                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 141       TEST DEST MODE 5 W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
012010  005212                  TS141:  INC     (R2)            ;UPDATE TEST NUMBER
012012  022712  000141                  CMP     #141,(R2)       ;SEQUENCE ERROR?
012016  001034                          BNE     TS142-10        ;BR TO ERROR HALT ON SEQ ERROR
012020  005000                          CLR     R0              ;R0=0
012022  005010                          CLR     (R0)            ;LOC 0=0
012024  052710  100000                  BIS     #100000,(R0)    ;LOC. 0=100000
012030  052700  000402                  BIS     #402,R0         ;R0=2
012034  000277                          SCC                     ;SET ALL COND. CODE BITS
012036  032750  100000                  BIT     #100000,@-(R0)  ;TRY DOPNM W/MODE 5
012042  102403                          BVS     DNM5A           ;BR TO ERROR IF V-BIT SET
012044  103002                          BCC     DNM5A           ;BR TO ERROR IF C-BIT CLEAR
012046  001401                          BEQ     DNM5A           ;BR TO ERROR IF Z-BIT SET
012050  100404                          BMI     DNM5B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 762            <====
```

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012052                          DNM5A:
012052  012742  000271                  MOV     #271,-(R2)      ;MOVE TO MAILBOX #  *******  271  *******
012056  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012060  000000                          HALT                    ;COND, CODES INCORRECT
012062  022700  000400          DNM5B:  CMP #400,R0             ;CHECK DEST. REGISTER
012066  001404                          BEQ     DNM5C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 753             <====
012070  012742  000272                  MOV     #272,-(R2)      ;MOVE TO MAILBOX #  *******  272  *******
012074  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012076  000000                          HALT                    ;DEST. REGISTER NOT DECREMENTED BY 2
012100  022737  100000  000000  DNM5C:  CMP     #100000,@#0     ;CHECK DESTINATION DATA
012106  001404                          BEQ     TS142
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 743             <====
012110  012742  000273                  MOV     #273,-(R2)      ;MOVE TO MAILBOX #  *******  273  *******
012114  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012116  000000                          HALT                    ;DEST. DATA INCORRECTLY MODIFIED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 142       TEST DEST. MODE 6 W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
012120  005212                  TS142:  INC     (R2)            ;UPDATE TEST NUMBER
012122  022712  000142                  CMP     #142,(R2)       ;SEQUENCE ERROR?
012126  001033                          BNE     TS143-10        ;BR TO ERROR HALT ON SEQ ERROR
012130  005000                          CLR     R0              ;R0=0
012132  005010                          CLR     (R0)            ;LOC> 0=0
012134  052710  000001                  BIS     #1,(R0)         ;LOC. 0=1
012140  005100                          COM     R0              ;R0=-1 C-BIT=1
012142  032760  000001  000001          BIT     #1,1(R0)        ;TRY DOPNM W/MODE 6
012150  001403                          BEQ     DNM6A           ;BR TO ERROR IF Z-BIT SET
012152  102402                          BVS     DNM6A           ;BR TO ERROR IF V-BIT SET
012154  103001                          BCC     DNM6A           ;BR TO ERROR IF C-BIT CLEAR
012156  100004                          BPL     DNM6B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 763             <====
012160                          DNM6A:
012160  012742  000274                  MOV     #274,-(R2)      ;MOVE TO MAILBOX #  *******  274  *******
012164  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012166  000000                          HALT                    ;COND CODES INCORRECT
012170  022700  177777          DNM6B:  CMP     #-1,R0          ;CHECK DEST. REGISTER
012174  001404                          BEQ     DNM6C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 754             <====
012176  012742  000275                  MOV     #275,-(R2)      ;MOVE TO MAILBOX #  *******  275  *******
012202  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012204  000000                          HALT                    ;DEST. REGISTER MODIFIED
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012206 022737 000001 000000 DNM6C:  CMP     #1,@#0          ;CHECK DEST. DATA
012214 001404                       BEQ     TS143
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 744            <====
012216 012742 000276                MOV     #276,-(R2)      ;MOVE TO MAILBOX # ******* 276 *******
012222 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012224 000000                       HALT                    ;DEST. DATA MODIFIED
                                                            ; OR SEQUENCE ERROR

                            ;*******************************************************************************
                            ;TEST 143       TEST DEST MODE 7 W/DOP NON-MODIFYING INST.
                            ;*******************************************************************************
012226 005212               TS143:  INC     (R2)            ;UPDATE TEST NUMBER
012230 022712 000143                CMP     #143,(R2)       ;SEQUENCE ERROR?
012234 001034                       BNE     TS144-10        ;BR TO ERROR HALT ON SEQ ERROR
012236 005000                       CLR     R0              ;R0=0
012240 005010                       CLR     (R0)            ;LOC. 0=0 C-BIT=0
012242 052710 125125                BIS     #125125,(R0)    ;LOC. 0=125125
012246 052700 000001                BIS     #1,R0           ;R0=1
012252 132770 000125 000403         BITB    #125,@403(R0)   ;TRY DOPNM W/MODE 7
012260 102403                       BVS     DNM7A           ;BR TO ERROR IF V-BIT SET
012262 100402                       BMI     DNM7A           ;BR TO ERROR IF N-BIT SET
012264 103401                       BCS     DNM7A           ;BR TO ERROR IF C-BIT SET
012266 001404                       BEQ     DNM7B
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 762            <====
012270                      DNM7A:
012270 012742 000277                MOV     #277,-(R2)      ;MOVE TO MAILBOX # ******* 277 *******
012274 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012276 000000                       HALT                    ;COND. CODES INCORRECT
012300 022700 000001        DNM7B:  CMP     #1,R0           ;CHECK DEST. REGISTER
012304 001404                       BEQ     DNM7C
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 753            <====
012306 012742 000300                MOV     #300,-(R2)      ;MOVE TO MAILBOX # ******* 300 *******
012312 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012314 000000                       HALT                    ;DESTINATION REGISTER MODIFIED
012316 022737 125125 000000 DNM7C:  CMP     #125125,@#0     ;CHECK DEST. DATA
012324 001404                       BEQ     TS144
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 743            <====
012326 012742 000301                MOV     #301,-(R2)      ;MOVE TO MAILBOX # ******* 301 *******
012332 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012334 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
                                        ;*******************************************************************************
012336  005212                          TS144:  INC     (R2)            ;UPDATE TEST NUMBER
012340  022712  000144                          CMP     #144,(R2)       ;SEQUENCE ERROR?
012344  001016                                  BNE     TS145-10        ;BR TO ERROR HALT ON SEQ ERROR
012346  005000                                  CLR     R0              ;R0=0
012350  005010                                  CLR     (R0)            ;LOC. 0=0
012352  005100                                  COM     R0              ;R0=-1
012354  005004                                  CLR     R4              ;R4 POINTS TO LOC. 0
012356  010014                                  MOV     R0,(R4)         ;TRY MOVE MODE 0,1
012360  102402                                  BVS     MDM1A           ;BR TO ERROR IF V SET
012362  001401                                  BEQ     MDM1A           ;BR TO ERROR IF Z SET
012364  100404                                  BMI     MDM1B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 767            <====
012366                                  MDM1A:
012366  012742  000302                          MOV     #302,-(R2)      ;MOVE TO MAILBOX #  *******  302  *******
012372  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012374  000000                                  HALT                    ;CONDITION CODE NOT CORRECT
012376  005704                          MDM1B:  TST     R4
012400  001404                                  BEQ     TS145
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 761            <====
012402  012742  000303                          MOV     #303,-(R2)      ;MOVE TO MAILBOX #  *******  303  *******
012406  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012410  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
                                        ;*******************************************************************************
012412  005212                          TS145:  INC     (R2)            ;UPDATE TEST NUMBER
012414  022712  000145                          CMP     #145,(R2)       ;SEQUENCE ERROR?
012420  001026                                  BNE     TS146-10        ;BR TO ERROR HALT ON SEQ ERROR
012422  005000                                  CLR     R0              ;R0=0
012424  005001                                  CLR     R1              ;R1=0
012426  005010                                  CLR     (R0)            ;LOC.0=0
012430  005110                                  COM     (R0)            ;LOC. 0=-1
012432  010120                                  MOV     R1,(R0)+        ;TRY MOVE MODE 0,2
012434  100402                                  BMI     MDM2A           ;BR TO ERROR IF N SET
012436  102401                                  BVS     MDM2A           ;BR TO ERROR IF V SET
```

```
012440  001404                          BEQ     MDM2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 767             <====
012442                          MDM2A:
012442  012742  000304                  MOV     #304,-(R2)      ;MOVE TO MAILBOX #  *******  304  *******
012446  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012450  000000                          HALT                    ;CC'S INCORRECT
012452  005300                  MDM2B:  DEC     R0
012454  005300                          DEC     R0
012456  001404                          BEQ     MDM2D
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 760             <====
012460                          MDM2C:
012460  012742  000305                  MOV     #305,-(R2)      ;MOVE TO MAILBOX #  *******  305  *******
012464  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012466  000000                          HALT                    ;DESTINATION REGISTER NOT INCREMENTED PROPERLY
012470  005737  000000          MDM2D:  TST     @#0
012474  001404                          BEQ     TS146
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 751             <====
012476  012742  000306                  MOV     #306,-(R2)      ;MOVE TO MAILBOX #  *******  306  *******
012502  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012504  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
                                ;*******************************************************************************
012506  005212                  TS146:  INC     (R2)            ;UPDATE TEST NUMBER
012510  022712  000146                  CMP     #146,(R2)       ;SEQUENCE ERROR?
012514  001046                          BNE     TS147-10        ;BR TO ERROR HALT ON SEQ ERROR
012516  005000                          CLR     R0              ;R0=0
012520  005010                          CLR     (R0)            ;LOC. 0=0
012522  112720  000125                  MOVB    #125,(R0)+      ;TRY DESTINATION MODE 2 W/EVEN BYTE
012526  102402                          BVS     MBDM2A          ;BR TO ERROR IF V SET
012530  001401                          BEQ     MBDM2A          ;BR TO ERROR IF Z SET
012532  100004                          BPL     MBDM2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 770             <====
012534                          MBDM2A:
012534  012742  000307                  MOV     #307,-(R2)      ;MOVE TO MAILBOX #  *******  307  *******
012540  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012542  000000                          HALT                    ;CC'S INCORRECT
```

```
012544  022700  000001          MBDM2B: CMP     #1,R0
012550  001404                          BEQ     MBDM2C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 761             <====
012552  012742  000310                  MOV     #310,-(R2)      ;MOVE TO MAILBOX #  *******  310  *******
012556  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012560  000000                          HALT                    ;REGISTER NOT INCREMENTED BY ONE
012562  112720  000252          MBDM2C: MOVB    #252,(R0)+      ;TRY DESTINATION MODE 2 W/ODD BYTE
012566  102402                          BVS     MBDM2D
012570  001401                          BEQ     MBDM2D
012572  100404                          BMI     MBDM2E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 750             <====
012574                                  MBDM2D:
012574  012742  000311                  MOV     #311,-(R2)      ;MOVE TO MAILBOX #  *******  311  *******
012600  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012602  000000                          HALT                    ;CC'S NOT SET CORRECT
012604  022700  000002          MBDM2E: CMP     #2,R0
012610  001404                          BEQ     MBDM2F
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 741             <====
012612  012742  000312                  MOV     #312,-(R2)      ;MOVE TO MAILBOX #  *******  312  *******
012616  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012620  000000                          HALT                    ;REGISTER NOT INCREMENTED BY ONE
012622  022737  125125  000000  MBDM2F: CMP     #125125,@#0     ;CHECK DATA
012630  001404                          BEQ     TS147
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 731             <====
012632  012742  000313                  MOV     #313,-(R2)      ;MOVE TO MAILBOX #  *******  313  *******
012636  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012640  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
                                ;*************************************************************************************
012642  005212                  TS147:  INC     (R2)            ;UPDATE TEST NUMBER
012644  022712  000147                  CMP     #147,(R2)       ;SEQUENCE ERROR?
012650  001057                          BNE     TS150-10        ;BR TO ERROR HALT ON SEQ ERROR
012652  012700  000400                  MOV     #400,R0         ;R0=400
012656  005010                          CLR     (R0)            ;LOC. 400 POINTS TO LOC. 0
012660  005037  000000                  CLR     @#0             ;LOC. 0=0
012664  012730  125252                  MOV     #125252,@(R0)+  ;TRY MOV DESTINATION MODE 2
```

```
012670  102402                          BVS     MDM3A           ;BR TO ERROR IF V SET
012672  001401                          BEQ     MDM3A           ;BR TO ERROR IF Z SET
012674  100404                          BMI     MDM3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 765            <====
012676                          MDM3A:
012676  012742  000314                  MOV     #314,-(R2)      ;MOVE TO MAILBOX #  *******  314  *******
012702  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012704  000000                          HALT                    ;CC'S INCORRECT
012706  022700  000402          MDM3B:  CMP     #402,R0         ;CHECK DEST. MODE REGISTER
012712  001404                          BEQ     MDM3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 756            <====
012714  012742  000315                  MOV     #315,-(R2)      ;MOVE TO MAILBOX #  *******  315  *******
012720  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012722  000000                          HALT                    ;REGISTER NOT INCREMENTED BY 2
012724  022737  125252  000000  MDM3C:  CMP     #125252,@#0     ;CHECK DESTINATION DATA
012732  001404                          BEQ     MDM3D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 746            <====
012734  012742  000316                  MOV     #316,-(R2)      ;MOVE TO MAILBOX #  *******  316  *******
012740  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012742  000000                          HALT                    ;DESTINATION DATA INCORRECT
012744  112737  000125  000000  MDM3D:  MOVB    #125,@#0        ;TRY MOVB DESTINATION MODE Z EVEN BYTE
012752  022737  125125  000000          CMP     #125125,@#0     ;CHECK DATA
012760  001404                          BEQ     MDM3E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 733            <====
012762  012742  000317                  MOV     #317,-(R2)      ;MOVE TO MAILBOX #  *******  317  *******
012766  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012770  000000                          HALT                    ;DESTINATION DATA INCORRECT
012772  112737  000525  000001  MDM3E:  MOVB    #525,@#1        ;TRY MOVB DESTINATION MODE 2 ODD BYTE
013000  022737  052525  000000          CMP     #52525,@#0      ;CHECK DATA
013006  001404                          BEQ     TS150
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 720            <====
013010  012742  000320                  MOV     #320,-(R2)      ;MOVE TO MAILBOX #  *******  320  *******
013014  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013016  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
                                          ;*******************************************************************************
013020  005212                            TS150:  INC     (R2)            ;UPDATE TEST NUMBER
013022  022712  000150                            CMP     #150,(R2)       ;SEQUENCE ERROR?
013026  001026                                    BNE     TS151-10        ;BR TO ERROR HALT ON SEQ ERROR
013030  005000                                    CLR     R0              ;R0=0
013032  005010                                    CLR     (R0)            ;LOC 0=0
013034  012704  000002                            MOV     #2,R4           ;R4=2
013040  012744  012345                            MOV     #12345,-(R4)    ;TRY MOV DEST. MODE 4
013044  102402                                    BVS     MDM4A           ;BR TO ERROR IF V-BIT SET
013046  001401                                    BEQ     MDM4A           ;BR TO ERROR IF Z-BIT SET
013050  100004                                    BPL     MDM4B
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 766            <====
013052                                    MDM4A:
013052  012742  000321                            MOV     #321,-(R2)      ;MOVE TO MAILBOX #  *******  321  *******
013056  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013060  000000                                    HALT                    ;CC'S NOT CORRECT
013062  005704                            MDM4B:  TST     R4              ;CHECK DECREMENTING OF MODE 4 REG.
013064  001404                                    BEQ     MDM4C
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 760            <====
013066  012742  000322                            MOV     #322,-(R2)      ;MOVE TO MAILBOX #  *******  322  *******
013072  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013074  000000                                    HALT                    ;DESTINATION MODE REGISTER NOT DECREMENTED BY 2
013076  022710  012345                    MDM4C:  CMP     #12345,(R0)     ;CHECK DESTINATION DATA
013102  001404                                    BEQ     TS151
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 751            <====
013104  012742  000323                            MOV     #323,-(R2)      ;MOVE TO MAILBOX #  *******  323  *******
013110  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013112  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
                                          ;*******************************************************************************
013114  005212                            TS151:  INC     (R2)            ;UPDATE TEST NUMBER
013116  022712  000151                            CMP     #151,(R2)       ;SEQUENCE ERROR?
013122  001046                                    BNE     TS152-10        ;BR TO ERROR HALT ON SEQ ERROR
```

```
013124  005004                          CLR     R4                  ;R4=0
013126  005014                          CLR     (R4)                ;LOC. 0=0
013130  012700  000002                  MOV     #2,R0               ;R0 = 2
013134  112740  125125                  MOVB    #125125,-(R0)       ;TRY MOVB DEST. MODE 4-ODD BYTE
013140  020027  000001                  CMP     R0,#1               ;CHECK THAT DEST. REG. WAS DECREMENTED
013144  001404                          BEQ     MBDM4A
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 766            <====
013146  012742  000324                  MOV     #324,-(R2)          ;MOVE TO MAILBOX #  *******  324  *******
013152  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
013154  000000                          HALT                        ;DESTINATION REG. NOT DECREMENTED BY 1
013156  021427  052400          MBDM4A: CMP     (R4),#52400         ;CHECK DEST. DATA
013162  001404                          BEQ     MBDM4B
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 757            <====
013164  012742  000325                  MOV     #325,-(R2)          ;MOVE TO MAILBOX #  *******  325  *******
013170  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
013172  000000                          HALT                        ;DEST. DATA NOT CORRECT
013174  112740  125125          MBDM4B: MOVB    #125125,-(R0)       ;TRY MOVB DEST. MODE 4--EVEN BYTE
013200  102402                          BVS     MBDM4C              ;BR. TO ERROR IF V-BIT SET
013202  001401                          BEQ     MBDM4C              ;BR TO ERROR IF Z-BIT SET
013204  100004                          BPL     MBDM4D
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 746            <====
013206                          MBDM4C:
013206  012742  000326                  MOV     #326,-(R2)          ;MOVE TO MAILBOX #  *******  326  *******
013212  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
013214  000000                          HALT                        ;COND. CODES INCORRECT
013216  005700                  MBDM4D: TST     R0                  ;CHECK MODE 4 DEST. REGISTER
013220  001404                          BEQ     MBDM4E
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 740            <====
013222  012742  000327                  MOV     #327,-(R2)          ;MOVE TO MAILBOX #  *******  327  *******
013226  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
013230  000000                          HALT                        ;DESTINATION REG NOT DECREMENTED BY 1
013232  021427  052525          MBDM4E: CMP     (R4),#52525         ;CHECK DEST. DAT^A
013236  001404                          BEQ     TS152
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 731            <====
013240  012742  000330                  MOV     #330,-(R2)          ;MOVE TO MAILBOX #  *******  330  *******
013244  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
013246  000000                          HALT                        ;DESTINATION DATA INCORRECT
                                                                    ;  OR SEQUENCE ERROR

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

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                                   ;       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
                                   ;*************************************************************************
013250  005212                     TS152:  INC     (R2)            ;UPDATE TEST NUMBER
013252  022712  000152                     CMP     #152,(R2)       ;SEQUENCE ERROR?
013256  001051                             BNE     TS153-10        ;BR TO ERROR HALT ON SEQ ERROR
013260  005004                             CLR     R4              ;R4=0
013262  005014                             CLR     (R4)            ;LOC. 0 = 0
013264  012700  000400                     MOV     #400,R0         ;R0=400
013270  012750  004321                     MOV     #4321,@-(R0)    ;TRY MOV DEST. MODE 5
013274  102402                             BVS     MDM5A           ;BR TO ERROR IF V-BIT SET
013276  001401                             BEQ     MDM5A           ;BR TO ERROR IF Z-BIT SET
013300  100004                             BPL     MDM5B
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 766            <====
013302                             MDM5A:
013302  012742  000331                     MOV     #331,-(R2)      ;MOVE TO MAILBOX #  *******  331  *******
013306  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013310  000000                             HALT                    ;COND. CODES INCORRECT
013312  022700  000376             MDM5B:  CMP     #376,R0         ;CHECK MODE 5 REG. WAS DECREMENTED
013316  001404                             BEQ     MDM5C
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 757            <====
013320  012742  000332                     MOV     #332,-(R2)      ;MOVE TO MAILBOX #  *******  332  *******
013324  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013326  000000                             HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
013330  022714  004321             MDM5C:  CMP     #4321,(R4)      ;CHECK DEST. DATA
013334  001404                             BEQ     MDM5D
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 750            <====
013336  012742  000333                     MOV     #333,-(R2)      ;MOVE TO MAILBOX #  *******  333  *******
013342  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013344  000000                             HALT                    ;DEST. DATA INCORRECT
013346  012700  000406             MDM5D:  MOV     #406,R0         ;R0=406
013352  112750  000377                     MOVB    #377,@-(R0)     ;TRY MOV DEST. MODE 5 --EVEN BYTE
013356  022700  000404                     CMP     #404,R0         ;CHECK MODE 5 REG.
013362  001404                             BEQ     MDM5E
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 735            <====
013364  012742  000334                     MOV     #334,-(R2)      ;MOVE TO MAILBOX #  *******  334  *******
013370  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
013372  000000                           HALT                      ;MODE 5 REGISTER NOT DECREMENTED BY 2
013374  022714  177721          MDM5E:   CMP     #177721,(R4)      ;CHECK DEST. DATA
013400  001404                           BEQ     TS153
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 726            <====
013402  012742  000335                   MOV     #335,-(R2)        ;MOVE TO MAILBOX #  *******  335  *******
013406  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
013410  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
                                ;*******************************************************************************
013412  005212                  TS153:   INC     (R2)              ;UPDATE TEST NUMBER
013414  022712  000153                   CMP     #153,(R2)         ;SEQUENCE ERROR?
013420  001054                           BNE     TS154-10          ;BR TO ERROR HALT ON SEQ ERROR
013422  005000                           CLR     R0                ;R0=0
013424  005010                           CLR     (R0)              ;LOC. 0=0
013426  005200                           INC     R0                ;R0=1
013430  012760  052525  177777           MOV     #052525,-1(R0)    ;TRY MOV DEST. MODE 6
013436  102402                           BVS     MDM6A             ;BR TO ERROR IF V-BIT SET
013440  001401                           BEQ     MDM6A             ;BR TO ERROR IF Z-BIT SET
013442  100004                           BPL     MDM6B
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 766            <====
013444                          MDM6A:
013444  012742  000336                   MOV     #336,-(R2)        ;MOVE TO MAILBOX #  *******  336  *******
013450  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
013452  000000                           HALT                      ;COND. CODES INCORRECT
013454  022700  000001          MDM6B:   CMP     #1,R0             ;CHECK DEST. REGISTER UNALTERED
013460  001404                           BEQ     MDM6C
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 757            <====
013462  012742  000337                   MOV     #337,-(R2)        ;MOVE TO MAILBOX #  *******  337  *******
013466  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
013470  000000                           HALT                      ;DEST. REGISTER INCORRECTLY ALTERED
013472  022737  052525  000000  MDM6C:   CMP     #52525,@#0        ;CHECK DEST. DATA
013500  001404                           BEQ     MDM6D
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 747            <====
```

```
013502  012742  000340                      MOV     #340,-(R2)      ;MOVE TO MAILBOX #  *******  340  *******
013506  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013510  000000                              HALT                    ;DEST. DATA INCORRECT
013512  012700  000002             MDM6D:   MOV     #2,R0           ;R0=2
013516  112760  000377  177777              MOVB    #377,-1(R0)     ;TRY MOVB DEST. MODE 6
013524  022700  000002                      CMP     #2,R0           ;CHECK DEST. REGISTER UNALTERED
013530  001404                              BEQ     MDM6E
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 733            <====
013532  012742  000341                      MOV     #341,-(R2)      ;MOVE TO MAILBOX #  *******  341  *******
013536  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013540  000000                              HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013542  022737  177525  000000     MDM6E:   CMP     #177525,@#0     ;CHECK DEST. DATA
013550  001404                              BEQ     TS154
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 723            <====
013552  012742  000342                      MOV     #342,-(R2)      ;MOVE TO MAILBOX #  *******  342  *******
013556  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013560  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
                                   ;*************************************************************************************
013562  005212                     TS154:   INC     (R2)            ;UPDATE TEST NUMBER
013564  022712  000154                      CMP     #154,(R2)       ;SEQUENCE ERROR?
013570  001053                              BNE     TS155-10        ;BR TO ERROR HALT ON SEQ ERROR
013572  005004                              CLR     R4              ;R4=0
013574  005014                              CLR     (R4)            ;LOC.0=0
013576  012700  000403                      MOV     #403,R0         ;R0=403
013602  012770  070707  177777              MOV     #70707,@-1(R0)  ;TRY MOV W/DEST MODE 7
013610  102402                              BVS     MDM7A           ;BR. TO ERROR IF V-BIT SET
013612  001401                              BEQ     MDM7A           ;BR TO ERROR IF Z-BIT SET
013614  100004                              BPL     MDM7B
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 765            <====
013616                             MDM7A:
013616  012742  000343                      MOV     #343,-(R2)      ;MOVE TO MAILBOX #  *******  343  *******
013622  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013624  000000                              HALT                    ;COND. CODES INCORRECT
013626  022700  000403             MDM7B:   CMP     #403,R0         ;CHECK DEST. REGISTER
013632  001404                              BEQ     MDM7C
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
```

```
                                                          ;                 CONDITIONAL BRANCH INST. AND     <====
                                                          ;                 REPLACE THE MOVE INSTRUCTION     <====
                                                          ;                 WHICH FOLLOWS W/ 756             <====
013634  012742  000344                  MOV     #344,-(R2)      ;MOVE TO MAILBOX # ******* 344 *******
013640  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013642  000000                          HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013644  022737  070707  000000  MDM7C:  CMP     #70707,@#0      ;CHECK DEST. DATA
013652  001404                          BEQ     MDM7D
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;                 CONDITIONAL BRANCH INST. AND     <====
                                                          ;                 REPLACE THE MOVE INSTRUCTION     <====
                                                          ;                 WHICH FOLLOWS W/ 746             <====
013654  012742  000345                  MOV     #345,-(R2)      ;MOVE TO MAILBOX # ******* 345 *******
013660  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013662  000000                          HALT                    ;DEST. DATA INCORRECT
013664  112770  107070  000001  MDM7D:  MOVB    #107070,@1(R0)  ;TRY MOVB W/DEST MODE 7--ODD BYTE
013672  022700  000403                  CMP     #403,R0         ;CHECK MODE 7 DEST. REG.
013676  001404                          BEQ     MDM7E
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;                 CONDITIONAL BRANCH INST. AND     <====
                                                          ;                 REPLACE THE MOVE INSTRUCTION     <====
                                                          ;                 WHICH FOLLOWS W/ 734             <====
013700  012742  000346                  MOV     #346,-(R2)      ;MOVE TO MAILBOX # ******* 346 *******
013704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013706  000000                          HALT                    ;DEST. DATA INCORRECT
013710  022737  034307  000000  MDM7E:  CMP     #34307,@#0      ;CHECK DEST. DATA
013716  001404                          BEQ     TS155
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;                 CONDITIONAL BRANCH INST. AND     <====
                                                          ;                 REPLACE THE MOVE INSTRUCTION     <====
                                                          ;                 WHICH FOLLOWS W/ 724             <====
013720  012742  000347                  MOV     #347,-(R2)      ;MOVE TO MAILBOX # ******* 347 *******
013724  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013726  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.
                                ;*******************************************************************************
013730  005212                  TS155:  INC     (R2)            ;UPDATE TEST NUMBER
013732  022712  000155                  CMP     #155,(R2)       ;SEQUENCE ERROR?
013736  001015                          BNE     DOP4            ;BR TO ERROR HALT ON SEQ ERROR
013740  012700  014012                  MOV     #TBL1,R0        ;INITIALIZE R0
013744  014037  014012                  MOV     -(R0),@#TBL1    ;TBL1=125252
```

```
013750  064037  014012            ADD     -(R0),@#TBL1       ;TBL1=000377
013754  144037  014012            BICB    -(R0),@#TBL1       ;TBL1=000252
013760  154037  014013            BISB    -(R0),@#TBL1+1     ;TBL1=125252
013764  024037  014012            CMP     -(R0),@#TBL1       ;CHECK RESULT
013770  001411                    BEQ     TS156
                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                             ;           CONDITIONAL BRANCH INST. AND      <====
                                                             ;           REPLACE THE MOVE INSTRUCTION      <====
                                                             ;           WHICH FOLLOWS W/ 762              <====
013772                    DOP4:
013772  012742  000350            MOV     #350,-(R2)         ;MOVE TO MAILBOX #  *******  350  *******
013776  005242                    INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
014000  000000                    HALT                       ;RESULT OF MODE 4 INSTS. INCORRECT
                                                             ;  OR SEQUENCE ERROR

014002  125252                    125252
014004  052652                    52652
014006  053125                    53125
014010  125252                    125252
014012  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.
                          ;*******************************************************************************
014014  005212            TS156:  INC     (R2)               ;UPDATE TEST NUMBER
014016  022712  000156            CMP     #156,(R2)          ;SEQUENCE ERROR?
014022  001015                    BNE     DOP5               ;BR TO ERROR HALT ON SEQ ERROR
014024  012700  014100            MOV     #TBL2+2,R0         ;INITIALIZE R0
014030  015037  014012            MOV     @-(R0),@#TBL1      ;TBL1=125252
014034  065037  014012            ADD     @-(R0),@#TBL1      ;TBL1=000377
014040  145037  014012            BICB    @-(R0),@#TBL1      ;TBL1=000252
014044  155037  014013            BISB    @-(R0),@#TBL1+1    ;TBL1=125252
014050  025037  014012            CMP     @-(R0),@#TBL1      ;CHECK RESULT
014054  001411                    BEQ     TS157
                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                             ;           CONDITIONAL BRANCH INST. AND      <====
                                                             ;           REPLACE THE MOVE INSTRUCTION      <====
                                                             ;           WHICH FOLLOWS W/ 762              <====
014056                    DOP5:
014056  012742  000351            MOV     #351,-(R2)         ;MOVE TO MAILBOX #  *******  351  *******
014062  005242                    INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
014064  000000                    HALT                       ;RESULT OF MODE 5 INSTS. INCORRECT
                                                             ;  OR SEQUENCE ERROR

014066  014002                    TBL1-10
014070  014004                    TBL1-6
014072  014005                    TBL1-5
014074  014006                    TBL1-4
```

```
 4830 014076 014010         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.
                                    ;*******************************************************************************
014100  005212                      TS157:  INC     (R2)                    ;UPDATE TEST NUMBER
014102  022712  000157                      CMP     #157,(R2)               ;SEQUENCE ERROR?
014106  001022                              BNE     TS160-10                ;BR TO ERROR HALT ON SEQ ERROR
014110  012700  014006                      MOV     #TBL1-4,R0              ;INITIALIZE R0
014114  016037  000002  014012              MOV     2(R0),@#TBL1            ;TBL1=125252
014122  066037  000000  014012              ADD     0(R0),@#TBL1            ;TBL1=000377
014130  146037  177777  014012              BICB    -1(R0),@#TBL1           ;TBL1=000252
014136  156037  177776  014013              BISB    -2(R0),@#TBL1+1         ;TBL1=125252
014144  026037  177774  014012              CMP     -4(R0),@#TBL1           ;CHECK RESULT
014152  001404                              BEQ     TS160
                                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                            ;           WHICH FOLLOWS W/ 755              <====
014154  012742  000352                      MOV     #352,-(R2)              ;MOVE TO MAILBOX #  *******  352  *******
014160  005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
014162  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.
                                    ;*******************************************************************************
014164  005212                      TS160:  INC     (R2)                    ;UPDATE TEST NUMBER
014166  022712  000160                      CMP     #160,(R2)               ;SEQUENCE ERROR?
014172  001022                              BNE     TS161-10                ;BR TO ERROR HALT ON SEQ ERROR
014174  012700  014072                      MOV     #TBL2-4,R0              ;INITIALIZE R0
014200  017037  000004  014012              MOV     @4(R0),@#TBL1           ;TBL1=125252
014206  067037  000002  014012              ADD     @2(R0),@#TBL1           ;TBL1=000377
014214  147037  000000  014012              BICB    @0(R0),@#TBL1           ;TBL1=000252
014222  157037  177776  014013              BISB    @-2(R0),@#TBL1+1                ;TBL1=125252
014230  027037  177774  014012              CMP     @-4(R0),@#TBL1          ;CHECK RESULT
014236  001404                              BEQ     TS161
                                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                            ;           CONDITIONAL BRANCH INST. AND      <====
```

```
                                                    ;               REPLACE THE MOVE INSTRUCTION   <====
                                                    ;               WHICH FOLLOWS W/ 755           <====
014240  012742  000353          MOV     #353,-(R2)  ;MOVE TO MAILBOX #  *******  353  *******
014244  005242                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
014246  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
                        ;*******************************************************************************
014250  005212          TS161:  INC     (R2)        ;UPDATE TEST NUMBER
014252  022712  000161          CMP     #161,(R2)   ;SEQUENCE ERROR?
014256  001026                  BNE     TS162-10    ;BR TO ERROR HALT ON SEQ ERROR
014260  012700  125252          MOV     #125252,R0  ;INITIALIZE DATA
014264  000261                  SEC                 ;SET C-BIT
014266  006100                  ROL     R0          ;TRY ROL W/ MODE 0
014270  102004                  BVC     ROT0A       ;CC=0011
014272  103003                  BCC     ROT0A
014274  022700  052525          CMP     #052525,R0  ;CHECK DATA
014300  001404                  BEQ     ROT0B
                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                    ;           CONDITIONAL BRANCH INST. AND   <====
                                                    ;           REPLACE THE MOVE INSTRUCTION   <====
                                                    ;           WHICH FOLLOWS W/ 766           <====
014302                  ROT0A:
014302  012742  000354          MOV     #354,-(R2)  ;MOVE TO MAILBOX #  *******  354  *******
014306  005242                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
014310  000000                  HALT                ;ROL MODE 0 FAILED
014312  012700  125252  ROT0B:  MOV     #125252,R0  ;INITIALIZE DATA
014316  000261                  SEC                 ;SET C-BIT
014320  106100                  ROLB    R0          ;TRY ROL W/ MODE 0 EVEN BYTE
014322  102004                  BVC     ROT0C       ;CC=0011
014324  103003                  BCC     ROT0C
014326  022700  125125          CMP     #125125,R0  ;CHECK DATA
014332  001404                  BEQ     TS162
                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                    ;           CONDITIONAL BRANCH INST. AND   <====
                                                    ;           REPLACE THE MOVE INSTRUCTION   <====
                                                    ;           WHICH FOLLOWS W/ 751           <====
014334                  ROT0C:
014334  012742  000355          MOV     #355,-(R2)  ;MOVE TO MAILBOX #  *******  355  *******
014340  005242                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
014342  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
                                        ;*******************************************************************************
014344  005212                          TS162:  INC     (R2)                    ;UPDATE TEST NUMBER
014346  022712  000162                          CMP     #162,(R2)               ;SEQUENCE ERROR?
014352  001051                                  BNE     TS163-10                ;BR TO ERROR HALT ON SEQ ERROR
014354  005000                                  CLR     R0                      ;POINT TO LOC. 0
014356  012710  052525                          MOV     #52525,(R0)             ;INITIALIZE DATA
014362  000241                                  CLC                             ;CLEAR C-BIT
014364  006110                                  ROL     (R0)                    ;TRY ROL W/ MODE 1
014366  102005                                  BVC     ROT1A                   ;CC=1010
014370  103404                                  BCS     ROT1A
014372  023727  000000  125252                  CMP     @#0,#125252             ;CHECK RESULT
014400  001404                                  BEQ     ROT1B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
014402                                  ROT1A:
014402  012742  000356                          MOV     #356,-(R2)              ;MOVE TO MAILBOX #  *******  356  *******
014406  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
014410  000000                                  HALT                            ;ROL MODE 1 FAILED
014412  000261                          ROT1B:  SEC
014414  012710  125252                          MOV     #125252,(R0)            ;INITIALIZE DATA
014420  106110                                  ROLB    (R0)                    ;TRY ROLB W/ MODE 1 EVEN BYTE
014422  102005                                  BVC     ROT1C                   ;CC=1011
014424  103004                                  BCC     ROT1C
014426  022737  125125  000000                  CMP     #125125,@#0             ;TEST RESULT
014434  001404                                  BEQ     ROT1D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 746            <====
014436                                  ROT1C:
014436  012742  000357                          MOV     #357,-(R2)              ;MOVE TO MAILBOX #  *******  357  *******
014442  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
014444  000000                                  HALT                            ;ROLB W/ MODE 1 EVEN BYTE FAILED
014446  012710  125252                  ROT1D:  MOV     #125252,(R0)
014452  005000                                  CLR     R0                      ;POINT TO ODD BYTE
014454  005200                                  INC     R0
014456  000261                                  SEC                             ;SET C-BIT
014460  106110                                  ROLB    (R0)                    ;TRY ROLB W/ MODE 1 ODD BYTE
014462  102005                                  BVC     ROT1E                   ;CC=0011
014464  103004                                  BCC     ROT1E
014466  022737  052652  000000                  CMP     #052652,@#0             ;CHECK DATA
014474  001404                                  BEQ     TS163
```

```
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 726            <====
014476                          ROT1E:
014476  012742  000360                  MOV     #360,-(R2)      ;MOVE TO MAILBOX #  *******  360  *******
014502  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014504  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
                                ;*******************************************************************************
014506  005212                  TS163:  INC     (R2)            ;UPDATE TEST NUMBER
014510  022712  000163                  CMP     #163,(R2)       ;SEQUENCE ERROR?
014514  001057                          BNE     TS164-10        ;BR TO ERROR HALT ON SEQ ERROR
014516  005000                          CLR     R0              ;POINT TO LOC 0
014520  012710  173737                  MOV     #173737,(R0)    ;INITIALIZE DATA
014524  000241                          CLC                     ;CLEAR C-BIT
014526  006120                          ROL     (R0)+           ;TRY ROL W/ MODE 2
014530  103007                          BCC     ROT2A           ;CHECK C-BIT
014532  022737  167676  000000          CMP     #167676,@#0     ;CHECK DATA
014540  001003                          BNE     ROT2A           ;BRANCH IF RESULT INCORRECT
014542  005300                          DEC     R0              ;TEST R0
014544  005300                          DEC     R0
014546  001404                          BEQ     ROT2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 762            <====
014550                          ROT2A:
014550  012742  000361                  MOV     #361,-(R2)      ;MOVE TO MAILBOX #  *******  361  *******
014554  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014556  000000                          HALT                    ;ROL W/ MODE 2 FAILED
014560  005000                  ROT2B:  CLR     R0              ;POINT TO LOC 0
014562  012710  004040                  MOV     #4040,(R0)      ;INITIALIZE DATA
014566  000241                          CLC                     ;CLEAR C-BIT
014570  106120                          ROLB    (R0)+           ;TRY ROLB W/ MODE 2 EVEN BYTE
014572  103406                          BCS     ROT2C           ;CHECK C-BIT
014574  022737  004100  000000          CMP     #4100,@#0       ;CHECK DATA
014602  001002                          BNE     ROT2C           ;BRANCH IF DATA INCORRECT
014604  005300                          DEC     R0              ;CHECK R0
014606  001404                          BEQ     ROT2D
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 742            <====
014610                          ROT2C:
014610  012742  000362                  MOV     #362,-(R2)      ;MOVE TO MAILBOX #  *******  362  *******
```

```
014614  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
014616  000000                           HALT                   ;ROLB W/ MODE 2 EVEN BYTE FAILED
014620  005000                   ROT2D:  CLR     R0             ;POINT TO LOC 0
014622  012710  004040                   MOV     #4040,(R0)     ;INITIALIZE DATA
014626  005200                           INC     R0             ;POINT TO ODD BYTE OF DATA
014630  000261                           SEC                    ;SET C-BIT
014632  106120                           ROLB    (R0)+          ;TRY ROL W/ MODE 2 ODD BYTE
014634  103407                           BCS     ROT2E          ;CHECK C-BIT
014636  022737  010440  000000           CMP     #10440,@#0     ;CHECK DATA
014644  001003                           BNE     ROT2E          ;BRANCH IF DATA INCORRECT
014646  005300                           DEC     R0             ;CHECK R0
014650  005300                           DEC     R0
014652  001404                           BEQ     TS164
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 720            <====
014654                           ROT2E:
014654  012742  000363                   MOV     #363,-(R2)     ;MOVE TO MAILBOX #  *******  363  *******
014660  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
014662  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
                                          ;*******************************************************************************
014664  005212                            TS164:  INC     (R2)            ;UPDATE TEST NUMBER
014666  022712  000164                            CMP     #164,(R2)       ;SEQUENCE ERROR?
014672  001051                                    BNE     TS165-10        ;BR TO ERROR HALT ON SEQ ERROR
014674  012737  052525  000000                    MOV     #52525,@#0      ;INITIALIZE DATA IN LOC 0
014702  000261                                    SEC                     ;SET C-BIT
014704  006137  000000                            ROL     @#0             ;TRO ROL W/ MODE 3
014710  103404                                    BCS     ROT3A           ;CHECK C-BIT
014712  022737  125253  000000                    CMP     #125253,@#0     ;CHECK DATA
014720  001404                                    BEQ     ROT3B
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 764            <====
014722                                    ROT3A:
014722  012742  000364                            MOV     #364,-(R2)      ;MOVE TO MAILBOX #  *******  364  *******
014726  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014730  000000                                    HALT                    ;ROL W/ MODE 3 FAILED
014732  012737  125252  000000            ROT3B:  MOV     #125252,@#0     ;INITIALIZE DATA
014740  000241                                    CLC                     ;CLEAR C-BIT
014742  106137  000000                            ROLB    @#0             ;TRY ROL W/ MODE 3 EVEN BYTE
014746  103004                                    BCC     ROT3C           ;CHECK C-BIT
014750  023727  000000  125124            4$:     CMP     @#0,#125124     ;CHECK DATA
014756  001404                                    BEQ     ROT3D
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 745            <====
014760                                    ROT3C:
014760  012742  000365                            MOV     #365,-(R2)      ;MOVE TO MAILBOX #  *******  365  *******
014764  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014766  000000                                    HALT                    ;ROL W/ MODE 3 EVEN BYTE FAILED
014770  012737  125252  000000            ROT3D:  MOV     #125252,@#0     ;INITIALIZE DATA IN LOC. 0
014776  000261                                    SEC                     ;SET C-BIT
015000  106137  000001                            ROLB    @#1             ;TRY ROL W/ MODE 3 ODD BYTE
015004  103004                                    BCC     ROT3E           ;CHECK C-BIT
015006  022737  052652  000000                    CMP     #052652,@#0     ;CHECK DATA
015014  001404                                    BEQ     TS165
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 726            <====
015016                                    ROT3E:
015016  012742  000366                            MOV     #366,-(R2)      ;MOVE TO MAILBOX #  *******  366  *******
015022  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015024  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
                                        ;*****************************************************************************
015026  005212                          TS165:  INC     (R2)            ;UPDATE TEST NUMBER
015030  022712  000165                          CMP     #165,(R2)       ;SEQUENCE ERROR?
015034  001016                                  BNE     TS166-10        ;BR TO ERROR HALT ON SEQ ERROR
015036  012737  070707  000000                  MOV     #070707,@#0     ;INITIALIZE DATA IN LOC. 0
015044  012700  000002                          MOV     #2,R0           ;INITIALIZE R0 AS POINTER
015050  000261                                  SEC                     ;SET C-BIT
015052  006140                                  ROL     -(R0)           ;TRY ROL W/ MODE 4
015054  103406                                  BCS     ROT4            ;CHECK C-BIT
015056  022737  161617  000000                  CMP     #161617,@#0     ;CHECK DATA
015064  001002                                  BNE     ROT4            ;BRANCH IF DATA INCORRECT
015066  005700                                  TST     R0              ;CHECK MODE 4 REGISTER
015070  001404                                  BEQ     TS166
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 761            <====
015072                                  ROT4:
015072  012742  000367                          MOV     #367,-(R2)      ;MOVE TO MAILBOX #  *******  367  *******
015076  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015100  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
                                        ;*****************************************************************************
015102  005212                          TS166:  INC     (R2)            ;UPDATE TEST NUMBER
015104  022712  000166                          CMP     #166,(R2)       ;SEQUENCE ERROR?
015110  001021                                  BNE     ROT5            ;BR TO ERROR HALT ON SEQ ERROR
015112  012737  015164  000000                  MOV     #ROTX,@#0       ;MOVE POINTER TO LOC. 0
015120  012700  000002                          MOV     #2,R0           ;SET MODE 5 REG. TO LOC. 0
015124  012767  107070  000032                  MOV     #107070,ROTX    ;INITIALIZE DATA
015132  000241                                  CLC                     ;CLEAR C-BIT
015134  006150                                  ROL     @-(R0)          ;TRY ROL W/ MODE 5
```

```
015136  103006                          BCC     ROT5                    ;CHECK C-BIT
015140  022737  016160  015164          CMP     #016160,@#ROTX          ;CHECK DATA
015146  001002                          BNE     ROT5                    ;BRANCH IF DATA INCORRECT
015150  005700                          TST     R0                      ;CHECK MODE 5 REGISTER
015152  001405                          BEQ     TS167
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 756             <====
015154                          ROT5:
015154  012742  000370                  MOV     #370,-(R2)              ;MOVE TO MAILBOX #  *******  370  *******
015160  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
015162  000000                          HALT                            ;ROL MODE 5 FAILED
                                                                        ;  OR SEQUENCE ERROR
015164  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
                                ;*******************************************************************************
015166  005212                  TS167:  INC     (R2)                    ;UPDATE TEST NUMBER
015170  022712  000167                  CMP     #167,(R2)               ;SEQUENCE ERROR?
015174  001013                          BNE     TS170-10                ;BR TO ERROR HALT ON SEQ ERROR
015176  012737  125252  015164          MOV     #125252,@#ROTX          ;INITIALIZE DATA
015204  000261                          SEC                             ;SET C-BIT
015206  006167  177752                  ROL     ROTX                    ;TRY ROL W/ MODE 6
015212  103004                          BCC     ROT6                    ;CHECK C-BIT
015214  022737  052525  015164          CMP     #52525,@#ROTX           ;CHECK DATA
015222  001404                          BEQ     TS170
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 764             <====
015224                          ROT6:
015224  012742  000371                  MOV     #371,-(R2)              ;MOVE TO MAILBOX #  *******  371  *******
015230  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
015232  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
                                        ;*************************************************************************
015234  005212                          TS170:  INC     (R2)            ;UPDATE TEST NUMBER
015236  022712  000170                          CMP     #170,(R2)       ;SEQUENCE ERROR?
015242  001016                                  BNE     ROT7            ;BR TO ERROR HALT ON SEQ ERROR
015244  012737  052525  015164                  MOV     #52525,@#ROTX   ;INITIALIZE DATA
015252  012737  015164  015310                  MOV     #ROTX,@#ROTXAD  ;INITIALIZE ADDRESS POINTER
015260  000241                                  CLC                     ;CLEAR C-BIT
015262  006177  000022                          ROL     @ROTXAD         ;TRY ROL W/ MODE 7
015266  103404                                  BCS     ROT7            ;CHECK C-BIT
015270  023727  015164  125252                  CMP     @#ROTX,#125252  ;CHECK DATA
015276  001405                                  BEQ     TS171
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 761            <====
015300                                  ROT7:
015300  012742  000372                          MOV     #372,-(R2)      ;MOVE TO MAILBOX #  *******  372  *******
015304  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015306  000000                                  HALT                    ;ROL W/ MODE 7 FAILED
                                                                        ;  OR SEQUENCE ERROR
015310  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.
                                        ;*************************************************************************
015312  005212                          TS171:  INC     (R2)            ;UPDATE TEST NUMBER
015314  022712  000171                          CMP     #171,(R2)       ;SEQUENCE ERROR?
015320  001013                                  BNE     TS172-10        ;BR TO ERROR HALT ON SEQ ERROR
015322  012700  177400                          MOV     #177400,R0      ;MOVE TEST PATTERN TO R0
015326  000300                                  SWAB    R0              ;TRY SWAB MODE 0
015330  100404                                  BMI     SB0
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 773            <====
015332  012742  000373                          MOV     #373,-(R2)      ;MOVE TO MAILBOX #  *******  373  *******
015336  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015340  000000                                  HALT                    ;SWAB DID NOT SET CC'S CORRECT
```

```
015342  022700  000377           SB0:    CMP     #377,R0         ;CHECK RESULT
015346  001404                           BEQ     TS172
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 764            <====
015350  012742  000374                   MOV     #374,-(R2)      ;MOVE TO MAILBOX #  *******  374  *******
015354  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015356  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
                                 ;*******************************************************************************
015360  005212                   TS172:  INC     (R2)            ;UPDATE TEST NUMBER
015362  022712  000172                   CMP     #172,(R2)       ;SEQUENCE ERROR?
015366  001011                           BNE     TS173-10        ;BR TO ERROR HALT ON SEQ ERROR
015370  012737  125652  000000           MOV     #125652,@#0     ;MOVE TEST PATTERN TO LOC. 0
015376  005000                           CLR     R0              ;R0=0
015400  000310                           SWAB    (R0)            ;TRY SWAB MODE 1
015402  022737  125253  000000           CMP     #125253,@#0     ;CHECK RESULT
015410  001404                           BEQ     TS173
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 766            <====
015412  012742  000375                   MOV     #375,-(R2)      ;MOVE TO MAILBOX #  *******  375  *******
015416  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015420  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
                                        ;*******************************************************************************
015422  005212                          TS173:  INC     (R2)            ;UPDATE TEST NUMBER
015424  022712  000173                          CMP     #173,(R2)       ;SEQUENCE ERROR?
015430  001020                                  BNE     TS174-10        ;BR TO ERROR HALT ON SEQ ERROR
015432  012737  125152  000000                  MOV     #125152,@#0     ;MOVE TEST PATTERN TO LOC. 0
015440  005000                                  CLR     R0              ;R0=0
015442  000320                                  SWAB    (R0)+           ;TRY SWAB MODE 2
015444  022737  065252  000000                  CMP     #65252,@#0      ;CHECK RESULT
015452  001404                                  BEQ     SB2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
015454  012742  000376                          MOV     #376,-(R2)      ;MOVE TO MAILBOX #  *******  376  *******
015460  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015462  000000                                  HALT                    ;RESULT OF SWAB MODE 0 FAILED
015464  162700  000002                  SB2:    SUB     #2,R0           ;CHECK EFFECT OF REG.
015470  001404                                  BEQ     TS174
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 757            <====
015472  012742  000377                          MOV     #377,-(R2)      ;MOVE TO MAILBOX #  *******  377  *******
015476  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015500  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.
                                        ;*******************************************************************************
015502  005212                          TS174:  INC     (R2)            ;UPDATE TEST NUMBER
015504  022712  000174                          CMP     #174,(R2)       ;SEQUENCE ERROR?
015510  001011                                  BNE     TS175-10        ;BR TO ERROR HALT ON SEQ ERROR
015512  012737  000377  000000                  MOV     #377,@#0        ;MOVE TEST PATTERN TO LOC. 0
015520  000337  000000                          SWAB    @#0             ;TRY SWAB W/ MODE 3
015524  022737  177400  000000                  CMP     #177400,@#0     ;CHECK RESULT
015532  001404                                  BEQ     TS175
```

```
                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                    ;           WHICH FOLLOWS W/ 766            <====
015534  012742  000400      MOV     #400,-(R2)      ;MOVE TO MAILBOX #  *******  400  *******
015540  005242              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015542  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
                                        ;*************************************************************************
015544  005212                          TS175:  INC     (R2)            ;UPDATE TEST NUMBER
015546  022712  000175                          CMP     #175,(R2)       ;SEQUENCE ERROR?
015552  001020                                  BNE     TS176-10        ;BR TO ERROR HALT ON SEQ ERROR
015554  012737  125652  000000                  MOV     #125652,@#0     ;MOVE TEST PATTERN TO LOC. 0
015562  012700  000002                          MOV     #2,R0           ;SET UP REGISTER POINTER
015566  000340                                  SWAB    -(R0)           ;TRY SWAB MODE 4
015570  022737  125253  000000                  CMP     #125253,@#0     ;CHECK RESULT
015576  001404                                  BEQ     SB4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 765            <====
015600  012742  000401                          MOV     #401,-(R2)      ;MOVE TO MAILBOX #  *******  401  *******
015604  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015606  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
015610  005700                          SB4:    TST     R0              ;CHECK EFFECT ON REG.
015612  001404                                  BEQ     TS176
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 757            <====
015614  012742  000402                          MOV     #402,-(R2)      ;MOVE TO MAILBOX #  *******  402  *******
015620  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015622  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.
                                            ;*******************************************************************************
015624  005212                              TS176:  INC     (R2)                    ;UPDATE TEST NUMBER
015626  022712  000176                              CMP     #176,(R2)               ;SEQUENCE ERROR?
015632  001021                                      BNE     SB5                     ;BR TO ERROR HALT ON SEQ ERROR
015634  012700  015712                              MOV     #SB5XAD+2,R0            ;SET UP POINTER TO WORK LOCATION
015640  012767  125125  000040                      MOV     #125125,SB5X            ;MOVE PATTERN TO WORK LOCATION
015646  000350                                      SWAB    @-(R0)                  ;TRY SWAB MODE 5
015650  022767  052652  000030                      CMP     #52652,SB5X             ;CHECK RESULT
015656  001404                                      BEQ     SB5A
                                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                    ;           WHICH FOLLOWS W/ 765             <====
015660  012742  000403                              MOV     #403,-(R2)              ;MOVE TO MAILBOX #  *******  403  *******
015664  005242                                      INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
015666  000000                                      HALT                            ;RESULT OF SWAB INCORRECT
015670  020027  015710                      SB5A:   CMP     R0,#SB5XAD              ;CHECK RESULT OF REG.
015674  001406                                      BEQ     TS177
                                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                    ;           WHICH FOLLOWS W/ 756             <====
015676                                      SB5:
015676  012742  000404                              MOV     #404,-(R2)              ;MOVE TO MAILBOX #  *******  404  *******
015702  005242                                      INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
015704  000000                                      HALT                            ;REGISTER VALUE INCORRECT
                                                                                    ;  OR SEQUENCE ERROR
015706  000000                              SB5X:   0                               ;WORK LOCATION
015710  015706                              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.
                                        ;*****************************************************************************
015712  005212                          TS177:  INC     (R2)            ;UPDATE TEST NUMBER
015714  022712  000177                          CMP     #177,(R2)       ;SEQUENCE ERROR?
015720  001013                                  BNE     SB6             ;BR TO ERROR HALT ON SEQ ERROR
015722  012767  125125  000030                  MOV     #125125,SB6X    ;MOVE PATTERN TO WORK LOCATION
015730  012700  015752                          MOV     #SB6X-6,R0      ;MOVE OFFSET POINTER TO R0
015734  000360  000006                          SWAB    6(R0)           ;TRY SWAB W/ MODE 6
015740  022760  052652  000006                  CMP     #52652,6(R0)    ;CHECK RESULT
015746  001405                                  BEQ     TS200
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
015750                                  SB6:
015750  012742  000405                          MOV     #405,-(R2)      ;MOVE TO MAILBOX #  *******  405  *******
015754  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015756  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
                                                                        ;  OR SEQUENCE ERROR
015760  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.
                                        ;*******************************************************************************
015762  005212                          TS200:  INC     (R2)            ;UPDATE TEST NUMBER
015764  022712  000200                          CMP     #200,(R2)       ;SEQUENCE ERROR?
015770  001013                                  BNE     SB7             ;BR TO ERROR HALT ON SEQ ERROR
015772  012767  177400  000030                  MOV     #177400,SB7X    ;MOVE PATTERN TO WORK LOCATION
016000  012700  015740                          MOV     #SB7XAD-72,R0   ;MOVE OFFSET POINTER TO R0
016004  000370  000072                          SWAB    @72(R0)         ;TRY SWAB MODE 7
016010  027027  000072  000377                  CMP     @72(R0),#377    ;CHECK RESULTS
016016  001406                                  BEQ     TS201
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 764             <====
016020                                  SB7:
016020  012742  000406                          MOV     #406,-(R2)      ;MOVE TO MAILBOX #  *******  406  *******
016024  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016026  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
                                                                        ;  OR SEQUENCE ERROR
016030  000000                          SB7X:   0                       ;WORK LOCATION
016032  016030                          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
                                        ;*****************************************************************************
016034  005212                          TS201:  INC     (R2)            ;UPDATE TEST NUMBER
016036  022712  000201                          CMP     #201,(R2)       ;SEQUENCE ERROR?
016042  001150                                  BNE     JMPCK+6         ;BR TO ERROR HALT ON SEQ ERROR
016044  005067  000326                          CLR     JMPSEQ          ;ESTABLISH A SEQUENCE CHECKER
016050  012700  016130                          MOV     #JMP2,R0        ;SET R0=JUMP TARGET
016054  000110                                  JMP     (R0)            ;TRY JMP MODE 1
016056  022700  016060                  JMP3:   CMP     #.+2,R0         ;CHECK RESULT OF MODE 2 JUMP
016062  001404                                  BEQ     JMP3A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 767             <====
016064  012742  000407                          MOV     #407,-(R2)      ;MOVE TO MAILBOX #  *******  407  *******
016070  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016072  000000                                  HALT                    ;REGISTER VALUE AFTER JMP MODE 2 INCORRECT
016074  026727  000276  000001          JMP3A:  CMP     JMPSEQ,#1       ;MAKE SURE JMPS ARE IN SEQUENCE: JMPSEQ=1?
016102  001404                                  BEQ     JMP3B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 757             <====
```

```
016104  012742  000410                      MOV     #410,-(R2)      ;MOVE TO MAILBOX #  *******  410  *******
016110  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016112  000000                              HALT                    ;SHOULD BE HERE FROM JMP MODE 2 ONLY
016114  012700  016126              JMP3B:  MOV     #IJMP4,R0       ;POINT R0 TO INDIRECT JMP ADDR.
016120  005267  000252                      INC     JMPSEQ          ;UPDATE SEQUENCE CHECKER
016124  000130                              JMP     @(R0)+          ;TRY JMP MODE 3
016126  016160                      IJMP4:  JMP4                    ;ADDRESS INDIRECT JUMP

016130  005767  000242              JMP2:   TST     JMPSEQ          ;CHECK THAT JMPS ARE IN SEQUENCE: JMPSEQ=0?
016134  001404                              BEQ     JMP2A
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 742             <====
016136  012742  000411                      MOV     #411,-(R2)      ;MOVE TO MAILBOX #  *******  411  *******
016142  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016144  000000                              HALT                    ;SHOULD BE HERE FROM JMP MODE 1 ONLY
016146  005267  000224              JMP2A:  INC     JMPSEQ          ;UPDATE SEQUENCE CHECKER
016152  012700  016056                      MOV     #JMP3,R0        ;SET R0=JUMP TARGET
016156  000120                              JMP     (R0)+           ;TRY A JUMP MODE 2 TO ''JMP3''
016160  022700  016130              JMP4:   CMP     #IJMP4+2,R0     ;CHECK RESULT OF REGISTER IN MODE 3 JUMP
016164  001404                              BEQ     JMP4A
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 726             <====
016166  012742  000412                      MOV     #412,-(R2)      ;MOVE TO MAILBOX #  *******  412  *******
016172  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016174  000000                              HALT                    ;REGISTER VALUE AFTER MODE 3 JUMP INCORRECT
016176  022767  000002  000172      JMP4A:  CMP     #2,JMPSEQ       ;CHECK JUMP SEQUENCE: JMPSEQ=2?
016204  001404                              BEQ     JMP4B
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 716             <====
016206  012742  000413                      MOV     #413,-(R2)      ;MOVE TO MAILBOX #  *******  413  *******
016212  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016214  000000                              HALT                    ;SHOULD BE ONLY FROM MODE 3 JUMP
016216  012700  016266              JMP4B:  MOV     #JMP5+2,R0      ;SET UP POINTER TO JUMP TARGET
016222  005267  000150                      INC     JMPSEQ          ;UPDATE SEQUENCE CHECKER
016226  000140                              JMP     -(R0)           ;TRY JUMP MODE 4 TO ''JMP4''

016230  022767  000004  000140      JMP6:   CMP     #4,JMPSEQ       ;CHECK THAT JUMPS ARE IN SEQUENCE: JMPSEQ=4?
016236  001404                              BEQ     JMP6A
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 701             <====
016240  012742  000414                      MOV     #414,-(R2)      ;MOVE TO MAILBOX #  *******  414  *******
016244  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016246  000000                              HALT                    ;SHOULD BE HERE ONLY FROM MODE 5 JUMP
016250  012700  016716              JMP6A:  MOV     #JMP7+376,R0    ;SET UP OFFSET POINTER TO JUMP TARGET
016254  005267  000116                      INC     JMPSEQ          ;UPDATE JUMP SEQUENCE
016260  000160  177402                      JMP     -376(R0)        ;TRY MODE 6 JUMP

016264  022767  000003  000104      JMP5:   CMP     #3,JMPSEQ       ;CHECK THAT JUMPS ARE IN SEQUENCE: JMPSEQ=3?
```

```
016272  001404                                  BEQ     JMP5A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 663           <====
016274  012742  000415                          MOV     #415,-(R2)      ;MOVE TO MAILBOX #  *******  415  *******
016300  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016302  000000                                  HALT                    ;SHOULD ONLY BE HERE FROM MODE 4 JUMP
016304  012700  016320                  JMP5A:  MOV     #IJMP5+2,R0     ;SET UP POINTER TO INDIRECT JUMP ADDR.
016310  005267  000062                          INC     JMPSEQ          ;UPDATE JUMP SEQUENCE
016314  000150                                  JMP     @-(R0)          ;TRY JUMP MODE 5 TO ''JMP6''
016316  016230                          IJMP5:  JMP6                    ;INDIRECT ADDRESS POINTER

016320  022767  000005  000050          JMP7:   CMP     #5,JMPSEQ       ;CHECK JUMPS IN SEQUENCE: JMPSEQ=5?
016326  001404                                  BEQ     JMP7A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 645           <====
016330  012742  000416                          MOV     #416,-(R2)      ;MOVE TO MAILBOX #  *******  416  *******
016334  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016336  000000                                  HALT                    ;SHOULD ONLY BE HERE FROM MODE 6 JUMP
016340  012700  016364                  JMP7A:  MOV     #IJMP+10,R0     ;SET UP OFFSET POINTER TO INDIRECT ADDR.
016344  005267  000026                          INC     JMPSEQ          ;UPDATE JUMP SEQUENCE
016350  000170  177770                          JMP     @-10(R0)        ;TRY MODE 7 JUMP
016354  016356                          IJMP:   JMPCK                   ;INDIRECT ADDRESS

016356  026727  000014  000006          JMPCK:  CMP     JMPSEQ,#6       ;CHECK JUMPS IN SEQUENCE: JMPSEQ
016364  001405                                  BEQ     TS202
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 626           <====
016366  012742  000417                          MOV     #417,-(R2)      ;MOVE TO MAILBOX #  *******  417  *******
016372  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016374  000000                                  HALT                    ;SHOULD ONLY BE HERE FROM MODE 6 JUMP
                                                                        ;  OR SEQUENCE ERROR
016376  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
                                        ;*************************************************************************
016400  005212                          TS202:  INC     (R2)                    ;UPDATE TEST NUMBER
016402  022712  000202                          CMP     #202,(R2)               ;SEQUENCE ERROR?
016406  001001                                  BNE     JSR0                    ;BR TO ERROR HALT ON SEQ ERROR
016410  000402                                  BR      JSR1
016412  000137  017046                  JSR0:   JMP     @#JSRCK1

016416  012706  001000                  JSR1:   MOV     #STBOT,R6               ;SET STACK POINTER
016422  012700  016530                          MOV     #JSR2,R0                ;SET TARGET ADDRESS
016426  005037  017026                          CLR     @#JSRSEQ                ;INITIALIZE SEQUENCE CHECKER
016432  005001                                  CLR     R1                      ;INITIALIZE R1
016434  005101                                  COM     R1
016436  004110                                  JSR     R1,(R0)                 ;TRY JSR MODE 1
                                                                                ; TO SCOPE: REPLACE THE MOVE INSTRUCTION   <====
                                                                                ;           FOLLOWING W/ 774               <====
016440                                  JSR1A:
016440  012742  000420                          MOV     #420,-(R2)              ;MOVE TO MAILBOX #  *******  420  *******
016444  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
016446  000000                                  HALT                            ;JSR MODE 1 FAILED

016450  022737  000001  017026          JSR3:   CMP     #1,@# JSRSEQ            ;CHECK SEQUENCE: JSRSEQ=1?
016456  001014                                  BNE     JSR3A                   ;BRANCH IF OUT OF SEQUENCE
016460  020127  016612                          CMP     R1,#JSR4                ;PROPER PC SAVED?
016464  001011                                  BNE     JSR3A                   ;BRANCH IF PC WRONG
016466  022706  000776                          CMP     #STBOT-2,R6             ;STACK POINTER DECREMENTED?
016472  001006                                  BNE     JSR3A                   ;BRANCH IF SP WRONG
016474  022716  125252                          CMP     #125252,(R6)            ;REG SAVED ON STACK?
016500  001003                                  BNE     JSR3A                   ;BRANCH IF REG. NOT SAVED
016502  022700  016452                          CMP     #JSR3+2,R0              ;MODE 2 INCREMENT CORRECT?
016506  001404                                  BEQ     JSR3B
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                                ;           WHICH FOLLOWS W/ 737           <====
016510                                  JSR3A:
016510  012742  000421                          MOV     #421,-(R2)              ;MOVE TO MAILBOX #  *******  421  *******
016514  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
```

```
016516  000000                            HALT                    ;JSR MODE 3 MALFUNCTIONED
016520  005237  017026            JSR3B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016524  004137  016612                    JSR     R1,@#JSR4       ;TRY JSR MODE 4

016530  005737  017026            JSR2:   TST     @#JSRSEQ        ;CHECK SEQUENCE: JSRSEQ=0?
016534  001011                            BNE     JSR2A           ;BRANCH IF OUT OF SEQUENCE
016536  020127  016440                    CMP     R1,#JSR1A       ;PROPER PC SAVED?
016542  001006                            BNE     JSR2A           ;BRANCH IF PC WRONG
016544  022706  000776                    CMP     #STBOT-2,R6     ;R6 DECREMENT?
016550  001003                            BNE     JSR2A           ;BRANCH IF R6 IS INCORRECT
016552  021627  177777                    CMP     (R6),#-1        ;REGISTER SAVED?
016556  001404                            BEQ     JSR2B
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                  ;           CONDITIONAL BRANCH INST. AND      <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                  ;           WHICH FOLLOWS W/ 713              <====
016560                            JSR2A:
016560  012742  000422                    MOV     #422,-(R2)      ;MOVE TO MAILBOX #  *******  422  *******
016564  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016566  000000                            HALT                    ;JSR MODE 1 MALFUNCTIONED
016570  012706  001000            JSR2B:  MOV     #STBOT,R6       ;INITIALIZE R6
016574  012701  125252                    MOV     #125252,R1      ;INITIALIZE R1
016600  005237  017026                    INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016604  012700  016450                    MOV     #JSR3,R0        ;SET TARGET ADDRESS
016610  004120                            JSR     R1,(R0)+        ;TRY JSR MODE 2

016612  022737  000002  017026    JSR4:   CMP     #2,@#JSRSEQ     ;CHECK SEQUENCE: JSRSEQ=2?
016620  001003                            BNE     JSR4A           ;BRANCH IF OUT OF SEQUENCE
016622  022701  016530                    CMP     #JSR2,R1        ;PROPER PC SAVED?
016626  001404                            BEQ     JSR4B
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                  ;           CONDITIONAL BRANCH INST. AND      <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                  ;           WHICH FOLLOWS W/ 667              <====
016630                            JSR4A:
016630  012742  000423                    MOV     #423,-(R2)      ;MOVE TO MAILBOX #  *******  423  *******
016634  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016636  000000                            HALT                    ;JSR MODE 3 MALFUNCTIONED
016640  005237  017026            JSR4B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016644  012700  016720                    MOV     #JSR5+2,R0      ;SET TARGET ADDRESS
016650  004140                            JSR     R1,-(R0)        ;TRY JSR MODE 4

016652  022767  000004  000146    JSR6:   CMP     #4,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ=4?
016660  001006                            BNE     JSR6A           ;BRANCH IF OUT OF SEQUENCE
016662  022701  016764                    CMP     #JSR7,R1        ;PROPER PC SAVED?
016666  001003                            BNE     JSR6A           ;BRANCH IF PC WRONG
016670  022700  017022                    CMP     #JSR6AD,R0      ;MODE 5 REGISTER CORRECT?
016674  001404                            BEQ     JSR6B
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                  ;           CONDITIONAL BRANCH INST. AND      <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                  ;           WHICH FOLLOWS W/ 644              <====
016676                            JSR6A:
016676  012742  000424                    MOV     #424,-(R2)      ;MOVE TO MAILBOX #  *******  424  *******
016702  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016704  000000                            HALT                    ;JSR MODE 5 FAILED
```

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016706  005237  017026          JSR6B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016712  004167  000046                  JSR     R1,JSR7         ;TRY JSR MODE 6
016716  022767  000003  000102  JSR5:   CMP     #3,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ=3?
016724  001006                          BNE     JSR5A           ;BRANCH IF OUT OF SEQUENCE
016726  022701  016652                  CMP     #JSR6,R1        ;PROPER PC SAVED?
016732  001003                          BNE     JSR5A           ;BRANCH IF PC WRONG
016734  022700  016716                  CMP     #JSR5,R0        ;CHECK MODE 4 REGISTER
016740  001404                          BEQ     JSR5B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 622            <====
016742                          JSR5A:
016742  012742  000425                  MOV     #425,-(R2)      ;MOVE TO MAILBOX #  *******  425  *******
016746  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016750  000000                          HALT                    ;JSR MODE 4 MALFUNCTIONED
016752  005237  017026          JSR5B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016756  012700  017024                  MOV     #JSR6AD+2,R0    ;POINT R0 TO TARGET ADDRESS
016762  004150                          JSR     R1,@-(R0)       ;TRY JSR MODE 5

016764  022737  000005  017026  JSR7:   CMP     #5,@#JSRSEQ     ;CHECK SEQUENCE: JSRSEQ=5?
016772  001003                          BNE     JSR7A           ;BRANCH IF OUT OF SEQUENCE
016774  022701  016716                  CMP     #JSR5,R1        ;PROPER PC SAVED?
017000  001404                          BEQ     JSR7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 602            <====
017002                          JSR7A:
017002  012742  000426                  MOV     #426,-(R2)      ;MOVE TO MAILBOX #  *******  426  *******
017006  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017010  000000                          HALT                    ;JSR MODE 6 FAILED
017012  005237  017026          JSR7B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
017016  004177  000002                  JSR     R1,@JSRCKAD     ;TRY JSR MODE 7

017022  016652                  JSR6AD: JSR6                    ;MODE 5 TARGET ADDRESS
017024  017030                  JSRCKAD:JSRCK                   ;MODE 7 TARGET ADDRESS
017026  000000                  JSRSEQ: 0                       ;SEQUENCE CHECKER

017030  022767  000006  177770  JSRCK:  CMP     #6,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ=6?
017036  001003                          BNE     JSRCK1          ;BRANCH IF OUT OF SEQUENCE
017040  022701  017022                  CMP     #JSR6AD,R1      ;PROPER PC SAVED?
017044  001404                          BEQ     TS203
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 560            <====
017046                          JSRCK1:
017046  012742  000427                  MOV     #427,-(R2)      ;MOVE TO MAILBOX #  *******  427  *******
017052  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017054  000000                          HALT                    ;JSR MODE 7 MALFUNCTIONED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       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
                                        ;*******************************************************************************
017056  005212                          TS203:  INC     (R2)            ;UPDATE TEST NUMBER
017060  022712  000203                          CMP     #203,(R2)       ;SEQUENCE ERROR?
017064  001016                                  BNE     TS204-10        ;BR TO ERROR HALT ON SEQ ERROR
017066  012706  001000                          MOV     #STBOT,R6       ;INITIALIZE STACK POINTER
017072  012746  052525                          MOV     #52525,-(R6)    ;INITIALIZE TOP OF STACK
017076  012700  017114                          MOV     #RTS1,R0        ;INITIALIZE RETURN REGISTER
017102  000200                                  RTS     R0              ;TRY RTS THROUGH R0
                                                                        ; TO SCOPE: REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           FOLLOWING W/ 770                <====
017104  012742  000430                          MOV     #430,-(R2)      ;MOVE TO MAILBOX #  *******  430  *******
017110  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017112  000000                                  HALT                    ;RTS FAILED
017114  022700  052525                  RTS1:   CMP     #52525,R0       ;CHECK THAT R0 RESTORED FROM STACK
017120  001404                                  BEQ     TS204
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 761            <====
017122  012742  000431                          MOV     #431,-(R2)      ;MOVE TO MAILBOX #  *******  431  *******
017126  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017130  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
                                ;*******************************************************************************
017132  005212                  TS204:  INC     (R2)            ;UPDATE TEST NUMBER
017134  022712  000204                  CMP     #204,(R2)       ;SEQUENCE ERROR?
017140  001022                          BNE     TS205-10        ;BR TO ERROR HALT ON SEQ ERROR
017142  000277                          SCC                     ;CC=0110
017144  000251                          +CLN!CLC
017146  012700  100000                  MOV     #100000,R0      ;CC=1000
017152  101402                          BLOS    MOV1
017154  102401                          BVS     MOV1
017156  100404                          BMI     MOV2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND    <====
                                                                ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                ;          WHICH FOLLOWS W/ 770            <====
017160                          MOV1:
017160  012742  000432                  MOV     #432,-(R2)      ;MOVE TO MAILBOX #  *******  432  *******
017164  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017166  000000                          HALT                    ;MOV DID NOT SET CC'S CORRECTLY

017170  000277                  MOV2:   SCC                     ;CC=1011
017172  000244                          CLZ
017174  012700  000000                  MOV     #0,R0           ;CC=0101
017200  101002                          BHI     MOV3            ;C OR Z = 0?
017202  102401                          BVS     MOV3            ;V=1?
017204  100004                          BPL     TS205
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND    <====
                                                                ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                ;          WHICH FOLLOWS W/ 755            <====
017206                          MOV3:
017206  012742  000433                  MOV     #433,-(R2)      ;MOVE TO MAILBOX #  *******  433  *******
017212  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017214  000000                          HALT                    ;MOV DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 205       TEST BIT INSTRUCTION
                                ;*******************************************************************************
017216  005212                  TS205:  INC     (R2)            ;UPDATE TEST NUMBER
017220  022712  000205                  CMP     #205,(R2)       ;SEQUENCE ERROR?
017224  001024                          BNE     TS206-10        ;BR TO ERROR HALT ON SEQ ERROR
```

```
017226  012700  100001                  MOV     #100001,R0
017232  000277                          SCC                             ;CC=0110
017234  000251                          +CLN!CLC
017236  032700  100000                  BIT     #100000,R0              ;CC=1000
017242  101402                          BLOS    BIT1
017244  102401                          BVS     BIT1
017246  100404                          BMI     BIT2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
017250                          BIT1:
017250  012742  000434                  MOV     #434,-(R2)              ;MOVE TO MAILBOX #  *******  434  *******
017254  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017256  000000                          HALT                            ;BIT DID NOT SET CC'S CORRECTLY

017260  000277                  BIT2:   SCC                             ;CC=1011
017262  000244                          CLZ
017264  032700  077776                  BIT     #77776,R0               ;CC=0101
017270  101002                          BHI     BIT3
017272  102401                          BVS     BIT3
017274  100004                          BPL     TS206
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 753           <====
017276                          BIT3:
017276  012742  000435                  MOV     #435,-(R2)              ;MOVE TO MAILBOX #  *******  435  *******
017302  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017304  000000                          HALT                            ;BIT DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR
                                ;*************************************************************************************
                                ;TEST 206       TEST BIC INSTRUCTION
                                ;*************************************************************************************
017306  005212                  TS206:  INC     (R2)                    ;UPDATE TEST NUMBER
017310  022712  000206                  CMP     #206,(R2)               ;SEQUENCE ERROR?
017314  001024                          BNE     TS207-10                ;BR TO ERROR HALT ON SEQ ERROR
017316  012700  177777                  MOV     #177777,R0
017322  000277                          SCC                             ;CC=0110
017324  000251                          +CLN!CLC
017326  042700  077777                  BIC     #77777,R0               ;CC=1000
017332  101402                          BLOS    BIC1
017334  102401                          BVS     BIC1
017336  100404                          BMI     BIC2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
017340                          BIC1:
017340  012742  000436                  MOV     #436,-(R2)              ;MOVE TO MAILBOX #  *******  436  *******
017344  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017346  000000                          HALT                            ;BIC DID NOT SET CC'S CORRECTLY
017350  000277                  BIC2:   SCC                             ;CC=1011
017352  000244                          CLZ
017354  042700  100000                  BIC     #100000,R0              ;CC=0101
017360  101002                          BHI     BIC3
```

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017362  102401                          BVS     BIC3
017364  100004                          BPL     TS207
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 753              <====
017366                          BIC3:
017366  012742  000437                  MOV     #437,-(R2)      ;MOVE TO MAILBOX #  *******  437  *******
017372  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017374  000000                          HALT                    ;BIC DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 207       TEST BIS INSTRUCTION
                                ;*******************************************************************************
017376  005212                  TS207:  INC     (R2)            ;UPDATE TEST NUMBER
017400  022712  000207                  CMP     #207,(R2)       ;SEQUENCE ERROR?
017404  001025                          BNE     TS210-10        ;BR TO ERROR HALT ON SEQ ERROR
017406  005000                          CLR     R0              ;R0=0
017410  000277                          SCC                     ;CC=1010
017412  000251                          +CLN!CLC
017414  052700  000000                  BIS     #0,R0           ;CC=0100  R0=0
017420  103403                          BCS     BIS1
017422  102402                          BVS     BIS1
017424  100401                          BMI     BIS1
017426  001404                          BEQ     BIS2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 766              <====
017430                          BIS1:
017430  012742  000440                  MOV     #440,-(R2)      ;MOVE TO MAILBOX #  *******  440  *******
017434  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017436  000000                          HALT                    ;BIS DID NOT SET CC'S CORRECTLY
017440  000277                  BIS2:   SCC                     ;CC=0111
017442  000250                          CLN
017444  052700  177777                  BIS     #177777,R0      ;CC=1001
017450  103003                          BCC     BIS3
017452  102402                          BVS     BIS3
017454  001401                          BEQ     BIS3
017456  100404                          BMI     TS210
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 752              <====
017460                          BIS3:
017460  012742  000441                  MOV     #441,-(R2)      ;MOVE TO MAILBOX #  *******  441  *******
017464  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017466  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
                                        ;*******************************************************************************
017470  005212                          TS210:  INC     (R2)            ;UPDATE TEST NUMBER
017472  022712  000210                          CMP     #210,(R2)       ;SEQUENCE ERROR?
017476  001037                                  BNE     TS211-10        ;BR TO ERROR HALT ON SEQ ERROR
017500  012700  077777                          MOV     #077777,R0      ;R0=077777
017504  000257                                  CCC                     ;CC=0100
017506  000264                                  SEZ
017510  005200                                  INC     R0              ;CC=1010   R0=10000
017512  101402                                  BLOS    INC1
017514  100001                                  BPL     INC1
017516  102404                                  BVS     INC2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 767             <====
017520                                  INC1:
017520  012742  000442                          MOV     #442,-(R2)      ;MOVE TO MAILBOX #  *******  442  *******
017524  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017526  000000                                  HALT                    ;INC DID NOT SET CC'S CORRECTLY
017530  052700  077777                  INC2:   BIS     #77777,R0       ;R0=177777
017534  000261                                  SEC                     ;CC=1011
017536  000244                                  CLZ
017540  005200                                  INC     R0              ;CC=0101   R0=0
017542  100403                                  BMI     INC3
017544  102402                                  BVS     INC3
017546  103001                                  BCC     INC3
017550  001404                                  BEQ     INC4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 752             <====
017552                                  INC3:
017552  012742  000443                          MOV     #443,-(R2)      ;MOVE TO MAILBOX #  *******  443  *******
017556  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017560  000000                                  HALT                    ;INC DID NOT SET CC'S CORRECTLY

017562  000277                          INC4:   SCC                     ;CC=1110
017564  000241                                  CLC
017566  005200                                  INC     R0              ;CC=0000   R0=1
017570  101402                                  BLOS    INC5
017572  100401                                  BMI     INC5
017574  100004                                  BPL     TS211
```

```
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                              ;           CONDITIONAL BRANCH INST. AND     <====
                                                              ;           REPLACE THE MOVE INSTRUCTION     <====
                                                              ;           WHICH FOLLOWS W/ 740             <====
 017576                           INC5:
 017576  012742  000444                   MOV    #444,-(R2)   ;MOVE TO MAILBOX #  *******  444  *******
 017602  005242                           INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
 017604  000000                           HALT                ;INC DID NOT SET CC'S CORRECTLY
                                                              ;  OR SEQUENCE ERROR

                                  ;*******************************************************************************
                                  ;TEST 211        TEST DEC INSTRUCTION
                                  ;*******************************************************************************
 017606  005212                   TS211:  INC    (R2)         ;UPDATE TEST NUMBER
 017610  022712  000211                   CMP    #211,(R2)    ;SEQUENCE ERROR?
 017614  001051                           BNE    TS212-10     ;BR TO ERROR HALT ON SEQ ERROR
 017616  012700  000002                   MOV    #2,R0        ;R0=2
 017622  000277                           SCC                 ;CC=1111
 017624  005300                           DEC    R0           ;CC=0001    R0=1
 017626  100403                           BMI    DEC1
 017630  001402                           BEQ    DEC1
 017632  102401                           BVS    DEC1
 017634  103404                           BCS    DEC2
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                              ;           CONDITIONAL BRANCH INST. AND     <====
                                                              ;           REPLACE THE MOVE INSTRUCTION     <====
                                                              ;           WHICH FOLLOWS W/ 767             <====
 017636                           DEC1:
 017636  012742  000445                   MOV    #445,-(R2)   ;MOVE TO MAILBOX #  *******  445  *******
 017642  005242                           INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
 017644  000000                           HALT                ;DEC DID NOT SET CC'S CORRECTLY
 017646  000261                   DEC2:   SEC                 ;CC=1011
 017650  000244                           CLZ
 017652  005300                           DEC    R0           ;CC=0101    R0=0
 017654  101002                           BHI    DEC3
 017656  100401                           BMI    DEC3
 017660  102004                           BVC    DEC4
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                              ;           CONDITIONAL BRANCH INST. AND     <====
                                                              ;           REPLACE THE MOVE INSTRUCTION     <====
                                                              ;           WHICH FOLLOWS W/ 755             <====
 017662                           DEC3:
 017662  012742  000446                   MOV    #446,-(R2)   ;MOVE TO MAILBOX #  *******  446  *******
 017666  005242                           INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
 017670  000000                           HALT                ;DEC DID NOT SET CC'S CORRECTLY
 017672  000277                   DEC4:   SCC                 ;CC=0110
 017674  000251                           +CLN!CLC
 017676  005300                           DEC    R0           ;CC=1000    R0=177777
 017700  101402                           BLOS   DEC5
 017702  102401                           BVS    DEC5
 017704  100404                           BMI    DEC6
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                              ;           CONDITIONAL BRANCH INST. AND     <====
                                                              ;           REPLACE THE MOVE INSTRUCTION     <====
                                                              ;           WHICH FOLLOWS W/ 743             <====
 017706                           DEC5:
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017706  012742  000447              MOV     #447,-(R2)      ;MOVE TO MAILBOX #  *******  447  *******
017712  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017714  000000                      HALT                    ;DEC DID NOT SET CC'S CORRECTLY
017716  042700  077777      DEC6:   BIC     #77777,R0       ;R0=100000
017722  000277                      SCC                     ;CC=0101
017724  000252                      +CLN!CLV
017726  005300                      DEC     R0              ;CC=1011   R0=77777
017730  100403                      BMI     DEC7            ;CC=0011
017732  001402                      BEQ     DEC7
017734  102001                      BVC     DEC7
017736  103404                      BCS     TS212
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 726            <====
017740                      DEC7:
017740  012742  000450              MOV     #450,-(R2)      ;MOVE TO MAILBOX #  *******  450  *******
017744  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017746  000000                      HALT                    ;DEC DID NOT SET CC'S CORRECTLY
                                                            ;  OR SEQUENCE ERROR
```

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                                ;*******************************************************************************
                                ;
                                ;       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
                                ;*******************************************************************************
017750  005212                  TS212:  INC     (R2)            ;UPDATE TEST NUMBER
017752  022712  000212                  CMP     #212,(R2)       ;SEQUENCE ERROR?
017756  001007                          BNE     TS213-10        ;BR TO ERROR HALT ON SEQ ERROR
017760  000277                          SCC                     ;CC=1011
017762  000244                          CLZ
017764  005000                          CLR     R0              ;CC=0100   R0=0
017766  100403                          BMI     CLR1
017770  102402                          BVS     CLR1
017772  103401                          BCS     CLR1
017774  001404                          BEQ     TS213
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 770            <====
017776                          CLR1:
017776  012742  000451                  MOV     #451,-(R2)      ;MOVE TO MAILBOX #  *******  451  *******
020002  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020004  000000                          HALT                    ;CLR DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 213        TEST TST INSTRUCTION
                                ;*******************************************************************************
020006  005212                  TS213:  INC     (R2)            ;UPDATE TEST NUMBER
020010  022712  000213                  CMP     #213,(R2)       ;SEQUENCE ERROR?
020014  001022                          BNE     TS214-10        ;BR TO ERROR HALT ON SEQ ERROR
020016  000277                          SCC                     ;CC=1011
020020  000244                          CLZ
020022  005700                          TST     R0              ;CC=0100
020024  100403                          BMI     TEST1
020026  102402                          BVS     TEST1
020030  103401                          BCS     TEST1
020032  001404                          BEQ     TEST2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 770            <====
020034                          TEST1:
020034  012742  000452                  MOV     #452,-(R2)      ;MOVE TO MAILBOX #  *******  452  *******
020040  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020042  000000                          HALT                    ;TEST DID NOT SET CC'S CORRECTLY
020044  005300                  TEST2:  DEC     R0              ;MAKE R0 NEGATIVE
020046  000277                          SCC                     ;CC=0111
```

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020050  000250                          CLN
020052  005700                          TST     R0              ;CC=1000
020054  101402                          BLOS    TEST3
020056  102401                          BVS     TEST3
020060  100404                          BMI     TS214
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 755             <====
020062                          TEST3:
020062  012742  000453                  MOV     #453,-(R2)      ;MOVE TO MAILBOX #  *******  453  *******
020066  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020070  000000                          HALT                    ;TEST DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 214       TEST SWAB INSTRUCTION
                                ;*******************************************************************************
020072  005212                  TS214:  INC     (R2)            ;UPDATE TEST NUMBER
020074  022712  000214                  CMP     #214,(R2)       ;SEQUENCE ERROR?
020100  001023                          BNE     TS215-10        ;BR TO ERROR HALT ON SEQ ERROR
020102  012700  170000                  MOV     #170000,R0      ;R0=170000
020106  000277                          SCC                     ;CC=0111
020110  000250                          CLN
020112  000300                          SWAB    R0              ;CC=1000   R0=360
020114  101402                          BLOS    SWB1
020116  102401                          BVS     SWB1
020120  100404                          BMI     SWB2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 767             <====
020122                          SWB1:
020122  012742  000454                  MOV     #454,-(R2)      ;MOVE TO MAILBOX #  *******  454  *******
020126  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020130  000000                          HALT                    ;SWAB DID NOT SET CC'S CORRECTLY
020132  000277                  SWB2:   SCC                     ;CC=1011
020134  000244                          CLZ
020136  000300                          SWAB    R0              ;CC=0100   R0=170000
020140  102403                          BVS     SWB3
020142  103402                          BCS     SWB3
020144  100401                          BMI     SWB3
020146  001404                          BEQ     TS215
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 754             <====
020150                          SWB3:
020150  012742  000455                  MOV     #455,-(R2)      ;MOVE TO MAILBOX #  *******  455  *******
020154  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020156  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
                                        ;*******************************************************************************
 020160  005212                         TS215:  INC     (R2)            ;UPDATE TEST NUMBER
 020162  022712  000215                         CMP     #215,(R2)       ;SEQUENCE ERROR?
 020166  001062                                 BNE     TS216-10        ;BR TO ERROR HALT ON SEQ ERROR
 020170  012700  040000                         MOV     #40000,R0       ;R0=40000
 020174  000277                                 SCC                     ;CC=1111
 020176  062700  030000                         ADD     #30000,R0       ;CC=0000   R0=70000
 020202  101402                                 BLOS    ADD1
 020204  102401                                 BVS     ADD1
 020206  100004                                 BPL     ADD2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 767           <====
 020210                                 ADD1:
 020210  012742  000456                         MOV     #456,-(R2)      ;MOVE TO MAILBOX #  *******  456  *******
 020214  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 020216  000000                                 HALT                    ;ADD DID NOT SET CC'S CORRECTLY
 020220  000264                         ADD2:   SEZ                     ;CC=0100

 020222  062700  010000                         ADD     #10000,R0       ;CC=1010   40=100000
 020226  101402                                 BLOS    ADD3
 020230  102001                                 BVC     ADD3
 020232  100404                                 BMI     ADD4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 755           <====
 020234                                 ADD3:
 020234  012742  000457                         MOV     #457,-(R2)      ;MOVE TO MAILBOX #  *******  457  *******
 020240  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 020242  000000                                 HALT                    ;ADD DID NOT SET CC'S CORRECTLY
 020244  000257                         ADD4:   CCC                     ;CC=1000
 020246  000270                                 SEN
 020250  062700  100000                         ADD     #100000,R0      ;CC=0111   R0=0
 020254  101002                                 BHI     ADD5
 020256  102001                                 BVC     ADD5
 020260  100004                                 BPL     ADD6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 742           <====
 020262                                 ADD5:
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020262  012742  000460              MOV     #460,-(R2)      ;MOVE TO MAILBOX #  *******  460  *******
020266  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020270  000000                      HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020272  062700  177777      ADD6:   ADD     #177777,R0      ;CC=1000   R0=177777
020276  101402                      BLOS    ADD7
020300  102401                      BVS     ADD7
020302  100404                      BMI     ADD8
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 731            <====
020304                      ADD7:
020304  012742  000461              MOV     #461,-(R2)      ;MOVE TO MAILBOX #  *******  461  *******
020310  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020312  000000                      HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020314  000277              ADD8:   SCC                     ;CC=1010
020316  000245                      +CLC!CLZ
020320  062700  000001              ADD     #1,R0           ;CC=0101   R=0
020324  102403                      BVS     ADD9
020326  103002                      BCC     ADD9
020330  100401                      BMI     ADD9
020332  001404                      BEQ     TS216
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 715            <====
020334                      ADD9:
020334  012742  000462              MOV     #462,-(R2)      ;MOVE TO MAILBOX #  *******  462  *******
020340  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020342  000000                      HALT                    ;ADD DID NOT SET CC'S CORRECTLY
                                                            ;  OR SEQUENCE ERROR

                            ;*******************************************************************************
                            ;TEST 216       TEST ADC INSTRUCTION
                            ;*******************************************************************************
020344  005212              TS216:  INC     (R2)            ;UPDATE TEST NUMBER
020346  022712  000216              CMP     #216,(R2)       ;SEQUENCE ERROR?
020352  001037                      BNE     TS217-10        ;BR TO ERROR HALT ON SEQ ERROR
020354  012700  077777              MOV     #077777,R0
020360  000277                      SCC                     ;CC=0101
020362  000252                      +CLN!CLV
020364  005500                      ADC     R0              ;CC=1010
020366  101402                      BLOS    ADC1
020370  102001                      BVC     ADC1
020372  100404                      BMI     ADC2
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 767            <====
020374                      ADC1:
020374  012742  000463              MOV     #463,-(R2)      ;MOVE TO MAILBOX #  *******  463  *******
020400  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020402  000000                      HALT                    ;ADC DID NOT SET CC'S CORRECTLY
020404  052700  077777      ADC2:   BIS     #77777,R0
020410  000277                      SCC                     ;CC=1011
020412  000244                      CLZ
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020414  005500                          ADC     R0              ;CC=0101   R0=0
020416  101002                          BHI     ADC3
020420  102401                          BVS     ADC3
020422  100004                          BPL     ADC4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 753              <====
020424                          ADC3:
020424  012742  000464                  MOV     #464,-(R2)      ;MOVE TO MAILBOX #  *******  464  *******
020430  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020432  000000                          HALT                    ;ADC DID NOT SET CC'S CORRECTLY
020434  000277                  ADC4:   SCC
020436  000245                          +CLZ!CLC                        ;CC=1010
020440  005500                          ADC     R0              ;CC=0100
020442  102403                          BVS     ADC5
020444  103402                          BCS     ADC5
020446  100401                          BMI     ADC5
020450  001404                          BEQ     TS217
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 740              <====
020452                          ADC5:
020452  012742  000465                  MOV     #465,-(R2)      ;MOVE TO MAILBOX #  *******  465  *******
020456  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020460  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 GENERATE DIFFERENT
                                    ;COMBINATIONS OF THE C AND V BITS.
                                    ;
                                    ;*****************************************************************************
                                    ;TEST 217        TEST NEG INSTRUCTION
                                    ;*****************************************************************************
020462  005212                      TS217:  INC     (R2)            ;UPDATE TEST NUMBER
020464  022712  000217                      CMP     #217,(R2)       ;SEQUENCE ERROR?
020470  001042                              BNE     TS220-10        ;BR TO ERROR HALT ON SEQ ERROR
020472  012700  000001                      MOV     #1,R0
020476  000277                              SCC                     ;CC=0110
020500  000251                              +CLN!CLC
020502  005400                              NEG     R0              ;CC=1001    R0=177777
020504  103003                              BCC     NEG1
020506  102402                              BVS     NEG1
020510  001401                              BEQ     NEG1
020512  100404                              BMI     NEG2
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                    ;           CONDITIONAL BRANCH INST. AND      <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                    ;           WHICH FOLLOWS W/ 766              <====
020514                              NEG1:
020514  012742  000466                      MOV     #466,-(R2)      ;MOVE TO MAILBOX #  *******  466  *******
020520  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020522  000000                              HALT                    ;NEG DID NOT SET CC'S CORRECTLY
020524  042700  077777              NEG2:   BIC     #77777,R0
020530  000257                              CCC                     ;CC=0100
020532  000264                              SEZ
020534  005400                              NEG     R0              ;CC=1011    R0=100000
020536  102003                              BVC     NEG3
020540  103002                              BCC     NEG3
020542  001401                              BEQ     NEG3
020544  100404                              BMI     NEG4
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                    ;           CONDITIONAL BRANCH INST. AND      <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                    ;           WHICH FOLLOWS W/ 751              <====
020546                              NEG3:
020546  012742  000467                      MOV     #467,-(R2)      ;MOVE TO MAILBOX #  *******  467  *******
020552  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020554  000000                              HALT                    ;NEG DID NOT SET CC'S CORRECTLY
020556  005000                      NEG4:   CLR     R0
020560  000277                              SCC                     ;CC=1011
020562  000244                              CLZ
020564  005400                              NEG     R0              ;CC=0100    R0=0
020566  102403                              BVS     NEG5
020570  103402                              BCS     NEG5
020572  001001                              BNE     NEG5
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020574  100004                          BPL     TS220
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 735              <====
020576                          NEG5:
020576  012742  000470                  MOV     #470,-(R2)      ;MOVE TO MAILBOX #  *******  470  *******
020602  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020604  000000                          HALT                    ;NEG DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 220               TEST CMP INSTRUCTION
                                ;*******************************************************************************
020606  005212                  TS220:  INC     (R2)            ;UPDATE TEST NUMBER
020610  022712  000220                  CMP     #220,(R2)       ;SEQUENCE ERROR?
020614  001060                          BNE     TS221-10        ;BR TO ERROR HALT ON SEQ ERROR
020616  012700  000005                  MOV     #5,R0
020622  000257                          CCC                     ;CC=1010
020624  000271                          +SEN!SEC
020626  022700  000005                  CMP     #5,R0           ;CC=0101
020632  101002                          BHI     CMP1
020634  102401                          BVS     CMP1
020636  100004                          BPL     CMP2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 766              <====
020640                          CMP1:
020640  012742  000471                  MOV     #471,-(R2)      ;MOVE TO MAILBOX #  *******  471  *******
020544  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020646  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020650  012700  100000          CMP2:   MOV     #100000,R0
020654  000277                          SCC                     ;CC=1101
020656  000242                          CLV
020660  020027  077777                  CMP     R0,#77777       ;CC=0010
020664  101402                          BLOS    CMP3
020666  102001                          BVC     CMP3
020670  100004                          BPL     CMP4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 751              <====
020672                          CMP3:
020672  012742  000472                  MOV     #472,-(R2)      ;MOVE TO MAILBOX #  *******  472  *******
020676  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020700  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020702  052700  040000          CMP4:   BIS     #40000,R0       ;R0=140000
020706  000257                          CCC                     ;CC=0100
020710  000264                          SEZ
020712  022700  040000                  CMP     #40000,R0       ;CC=1011
020716  102003                          BVC     CMP5
020720  103002                          BCC     CMP5
020722  001401                          BEQ     CMP5
020724  100404                          BMI     CMP6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
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                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 733            <====
020726                          CMP5:
020726  012742  000473                  MOV     #473,-(R2)      ;MOVE TO MAILBOX #  *******  473  *******
020732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020734  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020736  042700  040000          CMP6:   BIC     #40000,R0
020742  000277                          SCC                     ;CC=1111
020744  022700  177777                  CMP     #-1,R0          ;CC=0000
020750  101402                          BLOS    CMP7
020752  102401                          BVS     CMP7
020754  100004                          BPL     TS221
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 717            <====
020756                          CMP7:
020756  012742  000474                  MOV     #474,-(R2)      ;MOVE TO MAILBOX #  *******  474  *******
020762  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020764  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
                                                        ;  OR SEQUENCE ERROR

                                ;*************************************************************************
                                ;TEST 221               TEST COM INSTRUCTION
                                ;*************************************************************************
020766  005212                  TS221:  INC     (R2)            ;UPDATE TEST NUMBER
020770  022712  000221                  CMP     #221,(R2)       ;SEQUENCE ERROR?
020774  001010                          BNE     TS222-10        ;BR TO ERROR HALT ON SEQ ERROR
020776  012700  177777                  MOV     #-1,R0
021002  000257                          CCC                     ;CC=1010
021004  000265                          +SEC!SEZ
021006  005100                          COM     R0              ;CC=0101
021010  101002                          BHI     COM1
021012  102401                          BVS     COM1
021014  100004                          BPL     TS222
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 767            <====
021016                          COM1:
021016  012742  000475                  MOV     #475,-(R2)      ;MOVE TO MAILBOX #  *******  475  *******
021022  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021024  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
                                 ;*******************************************************************************
 021026  005212                  TS222:  INC     (R2)            ;UPDATE TEST NUMBER
 021030  022712  000222                  CMP     #222,(R2)       ;SEQUENCE ERROR?
 021034  001055                          BNE     TS223-10        ;BR TO ERROR HALT ON SEQ ERROR
 021036  012700  125252                  MOV     #125252,R0
 021042  000257                          CCC                     ;CC=1010
 021044  000271                          +SEN!SEC
 021046  162700  125252                  SUB     #125252,R0      ;CC=0101    R0=0
 021052  101002                          BHI     SUB1
 021054  102401                          BVS     SUB1
 021056  100004                          BPL     SUB2
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 766            <====
 021060                          SUB1:
 021060  012742  000476                  MOV     #476,-(R2)      ;MOVE TO MAILBOX #  *******  476  *******
 021064  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 021066  000000                          HALT                    ;SUB DID NOT SET CC'S CORRECTLY
 021070  052700  100000          SUB2:   BIS     #100000,R0
 021074  000277                          SCC                     ;CC=1101
 021076  000242                          CLV
 021100  162700  077777                  SUB     #77777,R0       ;CC=0010    R0=1
 021104  101402                          BLOS    SUB3
 021106  102001                          BVC     SUB3
 021110  100004                          BPL     SUB4
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 751            <====
 021112                          SUB3:
 021112  012742  000477                  MOV     #477,-(R2)      ;MOVE TO MAILBOX #  *******  477  *******
 021116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 021120  000000                          HALT                    ;
 021122  005100                  SUB4:   COM     R0              ;R0=177777
 021124  000277                          SCC                     ;CC=11111

 021126  162700  100000                  SUB     #100000,R0      ;CC=0000    R0=77777
 021132  101402                          BLOS    SUB5
 021134  102401                          BVS     SUB5
 021136  100004                          BPL     SUB6
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
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                                                               ;                REPLACE THE MOVE INSTRUCTION    <====
                                                               ;                WHICH FOLLOWS W/ 736            <====
021140                           SUB5:
021140  012742  000500                   MOV     #500,-(R2)    ;MOVE TO MAILBOX #  *******  500  *******
021144  005242                           INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
021146  000000                           HALT                  ;SUB DID NOT SET CC'S CORRECTLY
021150  000257                   SUB6:   CCC                   ;CC=0100
021152  000264                           SEZ
021154  162700  140000                   SUB     #140000,R0    ;CC=1011
021160  102003                           BVC     SUB7
021162  103002                           BCC     SUB7
021164  001401                           BEQ     SUB7
021166  100404                           BMI     TS223
                                                               ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                               ;           CONDITIONAL BRANCH INST. AND         <====
                                                               ;           REPLACE THE MOVE INSTRUCTION         <====
                                                               ;           WHICH FOLLOWS W/ 722                 <====
021170                           SUB7:
021170  012742  000501                   MOV     #501,-(R2)    ;MOVE TO MAILBOX #  *******  501  *******
021174  005242                           INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
021176  000000                           HALT                  ;

                                 ;*******************************************************************************
                                 ;TEST 223        TEST SBC INSTRUCTION
                                 ;*******************************************************************************
021200  005212                   TS223:  INC     (R2)          ;UPDATE TEST NUMBER
021202  022712  000223                   CMP     #223,(R2)     ;SEQUENCE ERROR?
021206  001053                           BNE     TS224-10      ;BR TO ERROR HALT ON SEQ ERROR
021210  012700  000001                   MOV     #1,R0
021214  000277                           SCC                   ;CC=1011
021216  000244                           CLZ
021220  005600                           SBC     R0            ;CC=0100    R=0
021222  103403                           BCS     SBC1
021224  102402                           BVS     SBC1
021226  100401                           BMI     SBC1
021230  001404                           BEQ     SBC2
                                                               ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                               ;           CONDITIONAL BRANCH INST. AND         <====
                                                               ;           REPLACE THE MOVE INSTRUCTION         <====
                                                               ;           WHICH FOLLOWS W/ 766                 <====
021232                           SBC1:
021232  012742  000502                   MOV     #502,-(R2)    ;MOVE TO MAILBOX #  *******  502  *******
021236  005242                           INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
021240  000000                           HALT                  ;SBC DID NOT SET CC'S CORRECTLY
021242  000277                   SBC2:   SCC                   ;CC=1010
021244  000245                           +CLZ!CLC
021246  005600                           SBC     R0            ;CC=0100    R=0
021250  103403                           BCS     SBC3
021252  102402                           BVS     SBC3
021254  100401                           BMI     SBC3
021256  001404                           BEQ     SBC4
                                                               ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                               ;           CONDITIONAL BRANCH INST. AND         <====
                                                               ;           REPLACE THE MOVE INSTRUCTION         <====
                                                               ;           WHICH FOLLOWS W/ 753                 <====
021260                           SBC3:
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021260  012742  000503             MOV     #503,-(R2)      ;MOVE TO MAILBOX #  *******  503  *******
021264  005242                     INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021266  000000                     HALT                    ;SBC DID NOT SET CC'S CORRECTLY
021270  000277             SBC4:   SCC                     ;CC=0111
021272  000250                     CLN
021274  005600                     SBC     R0              ;CC=1001    R0=177777
021276  103003                     BCC     SBC5
021300  102402                     BVS     SBC5
021302  001401                     BEQ     SBC5
021304  100404                     BMI     SBC6
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                           ;           CONDITIONAL BRANCH INST. AND     <====
                                                           ;           REPLACE THE MOVE INSTRUCTION     <====
                                                           ;           WHICH FOLLOWS W/ 740             <====
021306                     SBC5:
021306  012742  000504             MOV     #504,-(R2)      ;MOVE TO MAILBOX #  *******  504  *******
021312  005242                     INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021314  000000                     HALT                    ;SBC DID NOT SET CC'S CORRECTLY
021316  042700  077777     SBC6:   BIC     #77777,R0       ;R0=100000
021322  000277                     SCC                     ;CC=1101
021324  000242                     CLV
021326  005600                     SBC     R0              ;CC=0010
021330  101402                     BLOS    SBC7
021332  102001                     BVC     SBC7
021334  100004                     BPL     TS224
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                           ;           CONDITIONAL BRANCH INST. AND     <====
                                                           ;           REPLACE THE MOVE INSTRUCTION     <====
                                                           ;           WHICH FOLLOWS W/ 724             <====
021336                     SBC7:
021336  012742  000505             MOV     #505,-(R2)      ;MOVE TO MAILBOX #  *******  505  *******
021342  005242                     INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021344  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
                                 ;*************************************************************************
021346  005212                   TS224:  INC     (R2)            ;UPDATE TEST NUMBER
021350  022712  000224                   CMP     #224,(R2)       ;SEQUENCE ERROR?
021354  001053                           BNE     TS225-10        ;BR TO ERROR HALT ON SEQ ERROR
021356  012700  144000                   MOV     #144000,R0      ;R0=144000
021362  000257                           CCC                     ;CC=0110
021364  000266                           +SEZ!SEV
021366  006100                           ROL     R0              ;CC=1001    R0=110000
021370  103003                           BCC     ROL1
021372  102402                           BVS     ROL1
021374  001401                           BEQ     ROL1
021376  100404                           BMI     ROL2
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 766            <====
021400                           ROL1:
021400  012742  000506                   MOV     #506,-(R2)      ;MOVE TO MAILBOX #  *******  506  *******
021404  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021406  000000                           HALT                    ;
021410  000277                   ROL2:   SCC                     ;CC=1100
021412  000243                           +CLV!CLC
021414  006100                           ROL     R0              ;CC=0011    R0=020000
021416  103003                           BCC     ROL3
021420  102002                           BVC     ROL3
021422  001401                           BEQ     ROL3
021424  100004                           BPL     ROL4
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 753            <====
021426                           ROL3:
021426  012742  000507                   MOV     #507,-(R2)      ;MOVE TO MAILBOX #  *******  507  *******
021432  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021434  000000                           HALT                    ;ROL DID NOT SET CC'S CORRECTLY
021436  000277                   ROL4:   SCC                     ;CC=0111
021440  000250                           CLN
021442  006100                           ROL     R0              ;CC=0000    R0=040001
021444  101402                           BLOS    ROL5
021446  102401                           BVS     ROL5
021450  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        <====
021452                            ROL5:
021452  012742  000510                   MOV     #510,-(R2)     ;MOVE TO MAILBOX #  *******  510  *******
021456  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
021460  000000                           HALT                   ;ROL DID NOT SET CC'S CORRECTLY
021462  000257                    ROL6:  CCC                    ;CC=0101
021464  000265                           +SEZ!SEC
021466  006100                           ROL     R0             ;CC=1010   R0=100003
021470  101405                           BLOS    ROL7
021472  102004                           BVC     ROL7
021474  100003                           BPL     ROL7
021476  022700  100003                   CMP     #100003,R0
021502  001404                           BEQ     TS225
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 724            <====
021504                            ROL7:
021504  012742  000511                   MOV     #511,-(R2)     ;MOVE TO MAILBOX #  *******  511  *******
021510  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
021512  000000                           HALT                   ;ROL MALFUNCTIONED
                                                                ;  OR SEQUENCE ERROR
                                  ;****************************************************************************
                                  ;TEST 225        TEST ROR INSTRUCTION
                                  ;****************************************************************************
021514  005212                    TS225: INC     (R2)           ;UPDATE TEST NUMBER
021516  022712  000225                   CMP     #225,(R2)      ;SEQUENCE ERROR?
021522  001051                           BNE     TS226-10       ;BR TO ERROR HALT ON SEQ ERROR
021524  012700  000023                   MOV     #23,R0         ;R0=23
021530  000277                           SCC                    ;CC=0111
021532  000250                           CLN
021534  006000                           ROR     R0             ;CC=1001   R0=100011
021536  102403                           BVS     ROR1
021540  103002                           BCC     ROR1
021542  001401                           BEQ     ROR1
021544  100404                           BMI     ROR2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 766            <====
021546                            ROR1:
021546  012742  000512                   MOV     #512,-(R2)     ;MOVE TO MAILBOX #  *******  512  *******
021552  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
021554  000000                           HALT                   ;ROR DID NOT SET CC'S CORRECTLY
021556  000257                    ROR2:  CCC                    ;CC=1100
021560  000274                           +SEN!SEZ
021562  006000                           ROR     R0             ;CC=0011   R0=040004
021564  102003                           BVC     ROR3
021566  103002                           BCC     ROR3
021570  001401                           BEQ     ROR3
021572  100004                           BPL     ROR4
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 753            <====
021574                            ROR3:
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021574  012742  000513                  MOV     #513,-(R2)      ;MOVE TO MAILBOX #  *******  513  *******
021600  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021602  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021604  000277                  ROR4:   SCC                     ;CC=1110
021606  000241                          CLC
021610  006000                          ROR     R0              ;CC=0000   R0=020002
021612  101403                          BLOS    ROR5
021614  102402                          BVS     ROR5
021616  001401                          BEQ     ROR5
021620  100004                          BPL     ROR6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 740            <====
021622                          ROR5:
021622  012742  000514                  MOV     #514,-(R2)      ;MOVE TO MAILBOX #  *******  514  *******
021626  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021630  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021632  000257                  ROR6:   CCC                     ;CC=0101
021634  000265                          +SEC!SEZ
021636  006000                          ROR     R0              ;CC=1010   R0=110001
021640  101402                          BLOS    ROR7
021642  102001                          BVC     ROR7
021644  100404                          BMI     TS226
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 726            <====
021646                          ROR7:
021646  012742  000515                  MOV     #515,-(R2)      ;MOVE TO MAILBOX #  *******  515  *******
021652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021654  000000                          HALT                    ;ROR DID NOT PRODUCE CORRECT RESULTS
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 226       TEST ASL INSTRUCTION
                                ;*******************************************************************************
021656  005212                  TS226:  INC     (R2)            ;UPDATE TEST NUMBER
021660  022712  000226                  CMP     #226,(R2)       ;SEQUENCE ERROR?
021664  001054                          BNE     TS227-10        ;BR TO ERROR HALT ON SEQ ERROR
021666  012700  144000                  MOV     #144000,R0      ;R0=14000
021672  000257                          CCC                     ;CC=0110
021674  000271                          +SEN!SEC
021676  006300                          ASL     R0              ;CC=1001   R0=110000
021700  103003                          BCC     ASL1
021702  102402                          BVS     ASL1
021704  001401                          BEQ     ASL1
021706  100404                          BMI     ASL2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
021710                          ASL1:
021710  012742  000516                  MOV     #516,-(R2)      ;MOVE TO MAILBOX #  *******  516  *******
021714  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021716  000000                          HALT                    ;
021720  000277                  ASL2:   SCC                     ;CC=1100
```

```
021722  000243                   +CLV!CLC
021724  006300                   ASL     R0              ;CC=0011   R0=020000
021726  103003                   BCC     ASL3
021730  102002                   BVC     ASL3
021732  001401                   BEQ     ASL3
021734  100004                   BPL     ASL4
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                         ;           CONDITIONAL BRANCH INST. AND    <====
                                                         ;           REPLACE THE MOVE INSTRUCTION    <====
                                                         ;           WHICH FOLLOWS W/ 753            <====
021736                   ASL3:
021736  012742  000517           MOV     #517,-(R2)      ;MOVE TO MAILBOX #  *******  517  *******
021742  005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021744  000000                   HALT                    ;ASL DID NOT SET CC'S CORRECTLY
021746  000277           ASL4:   SCC                     ;CC=0111
021750  000250                   CLN
021752  006300                   ASL     R0              ;CC=0000   R0=040000
021754  101402                   BLOS    ASL5
021756  102401                   BVS     ASL5
021760  100004                   BPL     ASL6
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                         ;           CONDITIONAL BRANCH INST. AND    <====
                                                         ;           REPLACE THE MOVE INSTRUCTION    <====
                                                         ;           WHICH FOLLOWS W/ 741            <====
021762                   ASL5:
021762  012742  000520           MOV     #520,-(R2)      ;MOVE TO MAILBOX #  *******  520  *******
021766  005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021770  000000                   HALT                    ;ASL DID NOT SET CC'S CORRECTLY
021772  000257           ASL6:   CCC                     ;CC=0101
021774  000265                   +SEZ!SEC
021776  006300                   ASL     R0              ;CC=1010   R0=100000
022000  103406                   BCS     ASL7
022002  001405                   BEQ     ASL7
022004  102004                   BVC     ASL7
022006  100003                   BPL     ASL7
022010  022700  100000           CMP     #100000,R0
022014  001404                   BEQ     TS227
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                         ;           CONDITIONAL BRANCH INST. AND    <====
                                                         ;           REPLACE THE MOVE INSTRUCTION    <====
                                                         ;           WHICH FOLLOWS W/ 723            <====
022016                   ASL7:
022016  012742  000521           MOV     #521,-(R2)      ;MOVE TO MAILBOX #  *******  521  *******
022022  005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022024  000000                   HALT                    ;ASL MALFUNCTIONED
                                                         ;  OR SEQUENCE ERROR
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                                        ;*******************************************************************************
                                        ;TEST 227         TEST ASR INSTRUCTION
                                        ;*******************************************************************************
 022026  005212                         TS227:  INC     (R2)              ;UPDATE TEST NUMBER
 022030  022712  000227                         CMP     #227,(R2)         ;SEQUENCE ERROR?
 022034  001060                                 BNE     TS230-10          ;BR TO ERROR HALT ON SEQ ERROR
 022036  012700  100023                         MOV     #100023,R0        ;R0=100023
 022042  000277                                 SCC                       ;CC=0110
 022044  000250                                 CLN
 022046  006200                                 ASR     R0                ;CC=1001    RP=140011
 022050  102403                                 BVS     ASR1
 022052  103002                                 BCC     ASR1
 022054  001401                                 BEQ     ASR1
 022056  100404                                 BMI     ASR2
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                          ;           WHICH FOLLOWS W/ 766             <====
 022060                                 ASR1:
 022060  012742  000522                         MOV     #522,-(R2)        ;MOVE TO MAILBOX #  *******  522  *******
 022064  005242                                 INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
 022066  000000                                 HALT                      ;ASR DID NOT SET CC'S CORRECTLY
 022070  042700  100000                 ASR2:   BIC     #100000,R0        ;R0=40011
 022074  000277                                 SCC                       ;CC=1100
 022076  000243                                 +CLV!CLC
 022100  006200                                 ASR     R0                ;CC=0011    R0=020004
 022102  102003                                 BVC     ASR3
 022104  103002                                 BCC     ASR3
 022106  001401                                 BEQ     ASR3
 022110  100004                                 BPL     ASR4
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                          ;           WHICH FOLLOWS W/ 751             <====
 022112                                 ASR3:
 022112  012742  000523                         MOV     #523,-(R2)        ;MOVE TO MAILBOX #  *******  523  *******
 022116  005242                                 INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
 022120  000000                                 HALT                      ;ASR DID NOT SET CC'S CORRECTLY
 022122  000277                         ASR4:   SCC                       ;CC=1111

 022124  006200                                 ASR     R0                ;CC=0000    R0=010002
 022126  101403                                 BLOS    ASR5
 022130  102402                                 BVS     ASR5
 022132  001401                                 BEQ     ASR5
 022134  100004                                 BPL     ASR6
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                          ;           WHICH FOLLOWS W/ 737             <====
 022136                                 ASR5:
 022136  012742  000524                         MOV     #524,-(R2)        ;MOVE TO MAILBOX #  *******  524  *******
 022142  005242                                 INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
 022144  000000                                 HALT                      ;ASR DID NOT SET CC'S CORRECTLY
 022146  052700  100000                 ASR6:   BIS     #100000,R0        ;R0=110002
 022152  000257                                 CCC                       ;CC=0101
 022154  000265                                 +SEZ!SEC
```

```
022156  006200                  ASR     R0              ;C=1010   R0=144001
022160  101406                  BLOS    ASR7
022162  102005                  BVC     ASR7
022164  100004                  BPL     ASR7
022166  001403                  BEQ     ASR7
022170  022700  144001          CMP     #144001,R0      ;CHECK RESULT OF ASR'S
022174  001404                  BEQ     TS230
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 717             <====
022176                  ASR7:
022176  012742  000525          MOV     #525,-(R2)      ;MOVE TO MAILBOX #  *******  525  *******
022202  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022204  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
                        ;*******************************************************************************
022206  005212          TS230:  INC     (R2)            ;UPDATE TEST NUMBER
022210  022712  000230          CMP     #230,(R2)       ;SEQUENCE ERROR?
022214  001033                  BNE     TS231-10        ;BR TO ERROR HALT ON SEQ ERROR
022216  005000                  CLR     R0
022220  000277                  SCC                     ;SET CC=1011
022222  000244                  CLZ
022224  006700                  SXT     R0              ;TRY SXT
022226  100006                  BPL     SXT0            ;TEST CC=1001
022230  001405                  BEQ     SXT0
022232  102404                  BVS     SXT0
022234  103003                  BCC     SXT0
022236  022700  177777          CMP     #-1,R0          ;CHECK DATA RESULT
022242  001404                  BEQ     SXT1
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 764             <====
022244                  SXT0:
022244  012742  000526          MOV     #526,-(R2)      ;MOVE TO MAILBOX #  *******  526  *******
022250  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022252  000000                  HALT                    ;RESULTS OF SXT INCORRECT
022254  005000          SXT1:   CLR     R0              ;R0=0
022256  005010                  CLR     (R0)            ;LOC. 0=0
022260  005110                  COM     (R0)            ;LOC. 0=177777
022262  000257                  CCC                     ;SET CC=0110
022264  000266                  +SEZ!SEV
```

```
022266  006710                      SXT     (R0)
022270  001005                      BNE     SXT2            ;TEST CC=0100
022272  103404                      BCS     SXT2
022274  102403                      BVS     SXT2
022276  100402                      BMI     SXT2
022300  005710                      TST     (R0)
022302  001404                      BEQ     TS231
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 744            <====
022304                      SXT2:
022304  012742  000527              MOV     #527,-(R2)      ;MOVE TO MAILBOX #  *******  527  *******
022310  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022312  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
                                   ;*************************************************************************
022314  005212                     TS231:  INC     (R2)            ;UPDATE TEST NUMBER
022316  022712  000231                     CMP     #231,(R2)       ;SEQUENCE ERROR?
022322  001035                             BNE     TS232-10        ;BR TO ERROR HALT ON SEQ ERROR
022324  012700  007463                     MOV     #7463,R0        ;SET UP R0
022330  012701  031525                     MOV     #31525,R1       ;SET UP R1
022334  000277                             SCC                     ;SET CC=1110
022336  000241                             CLC
022340  074100                             XOR     R1,R0           ;TRY XOR
022342  101406                             BLOS    XOR1            ;CC=0000?
022344  102405                             BVS     XOR1
022346  001404                             BEQ     XOR1
022350  100403                             BMI     XOR1
022352  022700  036146                     CMP     #36146,R0       ;DATA RESULT CORRECT?
022356  001404                             BEQ     XOR2
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 761            <====
022360                             XOR1:
022360  012742  000530                     MOV     #530,-(R2)      ;MOVE TO MAILBOX #  *******  530  *******
022364  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022366  000000                             HALT                    ;
022370  010104                     XOR2:   MOV     R1,R4
022372  000261                             SEC                     ;CC=1110
022374  000241                             CLC
022376  074400                             XOR     R4,R0           ;TRY XOR MODE 0,0
022400  101406                             BLOS    XOR3            ;CC=0000?
022402  102405                             BVS     XOR3
022404  001404                             BEQ     XOR3
022406  100403                             BMI     XOR3
022410  022700  007463                     CMP     #7463,R0
022414  001404                             BEQ     TS232
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 742            <====
022416                             XOR3:
022416  012742  000531                     MOV     #531,-(R2)      ;MOVE TO MAILBOX #  *******  531  *******
022422  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022424  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
                                        ;*******************************************************************************
022426  005212                          TS232:  INC     (R2)            ;UPDATE TEST NUMBER
022430  022712  000232                          CMP     #232,(R2)       ;SEQUENCE ERROR?
022434  001023                                  BNE     TS233-10        ;BR TO ERROR HALT ON SEQ ERROR
022436  012700  000525                          MOV     #525,R0
022442  010004                                  MOV     R0,R4
022444  000277                                  SCC                     ;SET CC=1111
022446  101002                          SOB1:   BHI     SOB2            ;CC=1111?
022450  100001                                  BPL     SOB2
022452  102404                                  BVS     SOB3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 770             <====
022454                                  SOB2:
022454  012742  000532                          MOV     #532,-(R2)      ;MOVE TO MAILBOX #  *******  532  *******
022460  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022462  000000                                  HALT                    ;
022464  005304                          SOB3:   DEC     R4              ;COUNT ITERATIONS
022466  000277                                  SCC                     ;CC=1111
022470  077012                                  SOB     R0,SOB1         ;DO SOB W/ R0
022472  101004                                  BHI     SOB4            ;CHECK CC=1111
022474  100003                                  BPL     SOB4
022476  102002                                  BVC     SOB4
022500  005704                                  TST     R4              ;ITERATION COUNT OK?
022502  001404                                  BEQ     TS233
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 754             <====
022504                                  SOB4:
022504  012742  000533                          MOV     #533,-(R2)      ;MOVE TO MAILBOX #  *******  533  *******
022510  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022512  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
                                 ;*******************************************************************************
022514  005212                   TS233:  INC     (R2)                    ;UPDATE TEST NUMBER
022516  022712  000233                   CMP     #233,(R2)               ;SEQUENCE ERROR?
022522  001061                           BNE     TS234-10                ;BR TO ERROR HALT ON SEQ ERROR
022524  012706  001000                   MOV     #STBOT,SP
022530  012746  125252                   MOV     #125252,-(SP)           ;PUT R5 VALUE ON STACK
022534  162706  000074                   SUB     #74,SP                  ;EFFECTIVELY PUT 36 ARGUMENTS ON STACK
022540  012705  022564                   MOV     #MRK1,R5                ;SET NEW PC IN R5
022544  012746  006436                   MOV     #6436,-(SP)             ;PUT MARK 36 INST. ON STACK
022550  000277                           SCC                             ;SET CC=1111
022552  000116                           JMP     (SP)                    ;XFER CONTL TO MARK 36 INST. ON STACK
022554  012742  000534                   MOV     #534,-(R2)              ;MOVE TO MAILBOX #  *******  534  *******
022560  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
022562  000000                           HALT                            ;MARK INST. SHOULD HAVE JUMPED TO MRK1
022564  101010                   MRK1:   BHI     MRK2                    ;TEST CC UNAFFECTED
022566  100007                           BPL     MRK2                    ;IE. CC=1111
022570  102006                           BVC     MRK2
022572  020527  125252                   CMP     R5,#125252              ;CHECK R5 RESTORED FROM STACK
022576  001003                           BNE     MRK2
022600  022706  001000                   CMP     #STBOT,R6               ;CHECK STACK POINTER READJUSTED CORRECTLY.
022604  001404                           BEQ     MRK3
                                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                         ;           CONDITIONAL BRANCH INST. AND   <====
                                                                         ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                         ;           WHICH FOLLOWS W/ 746           <====
022606                           MRK2:
022606  012742  000535                   MOV     #535,-(R2)              ;MOVE TO MAILBOX #  *******  535  *******
022612  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
022614  000000                           HALT                            ;RESULTS OF MARK INCORRECT
022616  012746  052525           MRK3:   MOV     #52525,-(SP)
022622  012746  006400                   MOV     #6400,-(SP)             ;PUT MARK 0 INST. ON STACK
022626  010605                           MOV     SP,R5                   ;SET ADDR. OF MARK INST. IN R5
022630  004737  022640                   JSR     PC,@#MRK4               ;DO JSR
022634  000137  022652                   JMP     @#MRK5                  ;
022640  000205                   MRK4:   RTS     R5                      ;DO RTS WITH R5 TO MARK INST ON STACK
022642  012742  000536                   MOV     #536,-(R2)              ;MOVE TO MAILBOX #  *******  536  *******
022646  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
022650  000000                           HALT                            ;RTS,MARK SEQUENCE FAILED
022652  022706  001000           MRK5:   CMP     #STBOT,R6               ;STACK ADJUSTED CORRECTLY
022656  001003                           BNE     MRK6                    ;IF NOT:  BR
022660  022705  052525                   CMP     #52525,R5               ;CHECK IF R5 RESTORED FROM STACK
022664  001404                           BEQ     TS234
                                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                         ;           CONDITIONAL BRANCH INST. AND   <====
                                                                         ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                         ;           WHICH FOLLOWS W/ 716           <====
022666                           MRK6:
```

```
 7218  022666  012742  000537         MOV     #537,-(R2)      ;MOVE TO MAILBOX #  *******  537  *******
 7219  022672  005242                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 7220  022674  000000                 HALT                    ;RESULTS OF MARK INCORRECT
 7221                                                         ;  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
                                        ;*******************************************************************************
        022676  005212                  TS234:  INC     (R2)            ;UPDATE TEST NUMBER
        022700  022712  000234                  CMP     #234,(R2)       ;SEQUENCE ERROR?
        022704  001024                          BNE     TS235-10        ;BR TO ERROR HALT ON SEQ ERROR
        022706  012700  000377                  MOV     #377,R0
        022712  000257                          CCC
        022714  106400                          MTPS    R0
        022716  022767  000357  155052          CMP     #357,PS
        022724  001404                          BEQ     MTPS1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 767            <====
        022726  012742  000540                  MOV     #540,-(R2)      ;MOVE TO MAILBOX #  *******  540  *******
        022732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
        022734  000000                          HALT                    ;MTPS FAILED
        022736  005000                  MTPS1:  CLR     R0
        022740  005010                          CLR     (R0)
        022742  000277                          SCC                     ;CC=1111
        022744  106410                          MTPS    (R0)            ;TRY MTPS MODE 1
        022746  100403                          BMI     MTPS1A          ;CHECK PS
        022750  102402                          BVS     MTPS1A
        022752  103401                          BCS     MTPS1A
        022754  001004                          BNE     TS235
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 753            <====
        022756                          MTPS1A:
        022756  012742  000541                  MOV     #541,-(R2)      ;MOVE TO MAILBOX #  *******  541  *******
        022762  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
        022764  000000                          HALT                    ;MTPS FAILED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 235       TEST MTPS MODE 2
                                        ;*******************************************************************************
        022766  005212                  TS235:  INC     (R2)            ;UPDATE TEST NUMBER
        022770  022712  000235                  CMP     #235,(R2)       ;SEQUENCE ERROR?
        022774  001021                          BNE     TS236-10        ;BR TO ERROR HALT ON SEQ ERROR
        022776  005000                          CLR     R0              ;R0=0
        023000  012710  177777                  MOV     #-1,(R0)        ;LOC. 0=-1
        023004  005037  177776                  CLR     @#PS            ;PS=0
        023010  106420                          MTPS    (R0)+           ;TRY MTPS W/MODE 2
```

```
023012  022737  000357  177776            CMP     #357,@#PS        ;CHECK DATA
023020  001404                            BEQ     MTPS2
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 765             <====
023022  012742  000542                    MOV     #542,-(R2)       ;MOVE TO MAILBOX #  *******  542  *******
023026  005242                            INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
023030  000000                            HALT                     ;DEST. DATA INCORRECT
023032  022700  000001           MTPS2:   CMP     #1,R0            ;CHECK DEST. REGISTER.
023036  001404                            BEQ     TS236
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 756             <====
023040  012742  000543                    MOV     #543,-(R2)       ;MOVE TO MAILBOX #  *******  543  *******
023044  005242                            INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
023046  000000                            HALT                     ;DEST REGISTER NOT INCREMENTED BY 1
                                                                   ;  OR SEQUENCE ERROR

                                 ;*************************************************************************
                                 ;TEST 236          TEST MTPS MODE 3
                                 ;*************************************************************************
023050  005212                   TS236:   INC     (R2)             ;UPDATE TEST NUMBER
023052  022712  000236                    CMP     #236,(R2)        ;SEQUENCE ERROR?
023056  001024                            BNE     TS237-10         ;BR TO ERROR HALT ON SEQ ERROR
023060  012700  000402                    MOV     #402,R0          ;R0=402
023064  005010                            CLR     (R0)             ;LOC. 402=0
023066  012737  052652  000000            MOV     #52652,@#0       ;LOC. 0=52652
023074  005037  177776                    CLR     @#PS             ;PS=0
023100  106430                            MTPS    @(R0)+           ;TRY MTPS W/MODE 3
023102  022737  000252  177776            CMP     #252,@#PS        ;CHECK DEST. DATA
023110  001404                            BEQ     MTPS3
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 762             <====
023112  012742  000544                    MOV     #544,-(R2)       ;MOVE TO MAILBOX #  *******  544  *******
023116  005242                            INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
023120  000000                            HALT                     ;DEST. DATA INCORRECT
023122  022700  000404           MTPS3:   CMP     #404,R0          ;CHECK MODE 3 REGISTER.
023126  001404                            BEQ     TS237
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 753             <====
023130  012742  000545                    MOV     #545,-(R2)       ;MOVE TO MAILBOX #  *******  545  *******
023134  005242                            INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
023136  000000                            HALT                     ;MODE 3 REGISTER INCORRECT
                                                                   ;  OR SEQUENCE ERROR

                                 ;*************************************************************************
                                 ;TEST 237          TEST MTPS MODE 4
                                 ;*************************************************************************
023140  005212                   TS237:   INC     (R2)             ;UPDATE TEST NUMBER
023142  022712  000237                    CMP     #237,(R2)        ;SEQUENCE ERROR?
```

```
023146  001022                                  BNE     TS240-10                ;BR TO ERROR HALT ON SEQ ERROR
023150  012700  000001                          MOV     #1,R0                   ;R0=1
023154  012737  125125  000000                  MOV     #125125,@#0             ;LOC. 0 = 125125
023162  005037  177776                          CLR     @#PS                    ;PS=0
023166  106440                                  MTPS    -(R0)                   ;TRY MTPS W/MODE 4
023170  022737  000105  177776                  CMP     #105,@#PS               ;CHECK DEST. DATA
023176  001404                                  BEQ     MTPS4
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                                ;           WHICH FOLLOWS W/ 763            <====
023200  012742  000546                          MOV     #546,-(R2)              ;MOVE TO MAILBOX #  *******  546  *******
023204  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
023206  000000                                  HALT                            ;DEST. DATA INCORRECT
023210  005700                          MTPS4:  TST     R0                      ;CHECK MODE 4 REGISTER
023212  001404                                  BEQ     TS240
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                                ;           WHICH FOLLOWS W/ 755            <====
023214  012742  000547                          MOV     #547,-(R2)              ;MOVE TO MAILBOX #  *******  547  *******
023220  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
023222  000000                                  HALT                            ;MODE 4 REGISTER NOT DECREMENTED BY 1
                                                                                ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 240               TEST MTPS MODE 5
                                        ;*******************************************************************************
023224  005212                          TS240:  INC     (R2)                    ;UPDATE TEST NUMBER
023226  022712  000240                          CMP     #240,(R2)               ;SEQUENCE ERROR?
023232  001021                                  BNE     TS241-10                ;BR TO ERROR HALT ON SEQ ERROR
023234  012700  000404                          MOV     #404,R0                 ;R0=404
023240  012737  177400  000000                  MOV     #177400,@#0             ;LOC. 0=177400
023246  000277                                  SCC                             ;SET ALL COND. CODES
023250  106450                                  MTPS    @-(R0)                  ;TRY MTPS W/MODE 5
023252  005737  177776                          TST     @#PS                    ;CHECK DEST. DATA.
023256  001404                                  BEQ     MTPS5
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                                ;           WHICH FOLLOWS W/ 765            <====
023260  012742  000550                          MOV     #550,-(R2)              ;MOVE TO MAILBOX #  *******  550  *******
023264  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
023266  000000                                  HALT                            ;DESTINATION DATA INCORRECT
023270  022700  000402                  MTPS5:  CMP     #402,R0                 ;CHECK MODE 5 REGISTER
023274  001404                                  BEQ     TS241
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                                ;           WHICH FOLLOWS W/ 756            <====
023276  012742  000551                          MOV     #551,-(R2)              ;MOVE TO MAILBOX #  *******  551  *******
023302  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
023304  000000                                  HALT                            ;MODE 5 REGISTER NOT DECREMENTED BY 2
                                                                                ;  OR SEQUENCE ERROR

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

```
                                        ;TEST 241       TEST MTPS MODE 6
                                        ;*************************************************************************
023306  005212                          TS241:  INC     (R2)            ;UPDATE TEST NUMBER
023310  022712  000241                          CMP     #241,(R2)       ;SEQUENCE ERROR?
023314  001024                                  BNE     TS242-10        ;BR TO ERROR HALT ON SEQ ERROR
023316  012737  052652  000000                  MOV     #52652,@#0      ;LOC. 0=52652
023324  012700  000406                          MOV     #406,R0         ;R0=406
023330  005037  177776                          CLR     @#PS            ;PS=0
023334  106460  177372                          MTPS    -406(R0)        ;TRY MTPS W/MODE 6
023340  022737  000252  177776                  CMP     #252,@#PS       ;CHECK DEST. DATA
023346  001404                                  BEQ     MTPS6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 762             <====
023350  012742  000552                          MOV     #552,-(R2)      ;MOVE TO MAILBOX #  *******  552  *******
023354  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023356  000000                                  HALT                    ;DEST. DATA INCORRECT
023360  022700  000406                  MTPS6:  CMP     #406,R0         ;CHECK MODE 6 REGISTER
023364  001404                                  BEQ     TS242
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 753             <====
023366  012742  000553                          MOV     #553,-(R2)      ;MOVE TO MAILBOX #  *******  553  *******
023372  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023374  000000                                  HALT                    ;MODE 6 REGISTER MODIFIED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*************************************************************************
                                        ;TEST 242       TEST MTPS MODE 7
                                        ;*************************************************************************
023376  005212                          TS242:  INC     (R2)            ;UPDATE TEST NUMBER
023400  022712  000242                          CMP     #242,(R2)       ;SEQUENCE ERROR?
023404  001024                                  BNE     TS243-10        ;BR TO ERROR HALT ON SEQ ERROR
023406  012737  052652  000000                  MOV     #52652,@#0      ;LOC. 0=52652
023414  012700  000410                          MOV     #410,R0         ;R0=410
023420  005037  177776                          CLR     @#PS            ;PS=0
023424  106470  177776                          MTPS    @-2(R0)         ;TRY MTPS W/MODE 7
023430  022737  000105  177776                  CMP     #105,@#PS       ;CHECK DEST. DATA
023436  001404                                  BEQ     MTPS7
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 762             <====
023440  012742  000554                          MOV     #554,-(R2)      ;MOVE TO MAILBOX #  *******  554  *******
023444  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023446  000000                                  HALT                    ;DESTINATION DATA INCORRECT
023450  022700  000410                  MTPS7:  CMP     #410,R0         ;CHECK MODE 7 REGISTER
023454  001404                                  BEQ     TS243
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 753             <====
023456  012742  000555                          MOV     #555,-(R2)      ;MOVE TO MAILBOX #  *******  555  *******
023462  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
7446  023464  000000          HALT                    ;MODE 7 REGISTER MODIFIED
7447                                                  ;  OR SEQUENCE ERROR
7448
```

```
                                        ;*******************************************************************************
                                        ;
                                        ;       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
                                        ;*******************************************************************************
023466  005212                          TS243:  INC     (R2)            ;UPDATE TEST NUMBER
023470  022712  000243                          CMP     #243,(R2)       ;SEQUENCE ERROR?
023474  001025                                  BNE     TS244-10        ;BR TO ERROR HALT ON SEQ ERROR
023476  012737  000377  177776                  MOV     #377,@#PS
023504  106700                                  MFPS    R0
023506  022700  177757                          CMP     #177757,R0
023512  001404                                  BEQ     MFPS1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 770           <====
023514  012742  000556                          MOV     #556,-(R2)      ;MOVE TO MAILBOX #  *******  556  *******
023520  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023522  000000                                  HALT                    ;MFPS FAILED

023524  005000                          MFPS1:  CLR     R0
023526  012737  177777  000000                  MOV     #-1,@#0
023534  005037  177776                          CLR     @#PS
023540  106710                                  MFPS    (R0)
023542  105737  000000                          TSTB    @#0
023546  001404                                  BEQ     TS244
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 752           <====
023550  012742  000557                          MOV     #557,-(R2)      ;MOVE TO MAILBOX #  *******  557  *******
023554  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023556  000000                                  HALT                    ;MFPS FAILED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 244       TEST MFPS MODE 2
                                        ;*******************************************************************************
023560  005212                          TS244:  INC     (R2)            ;UPDATE TEST NUMBER
023562  022712  000244                          CMP     #244,(R2)       ;SEQUENCE ERROR?
023566  001031                                  BNE     TS245-10        ;BR TO ERROR HALT ON SEQ ERROR
023570  005000                                  CLR     R0              ;R0=0
023572  005010                                  CLR     (R0)            ;LOC. 0=0
023574  012737  000377  177776                  MOV     #377,@#PS       ;SET PS=357
023602  106720                                  MFPS    (R0)+           ;TRY MFPS W/MODE 2
023604  103003                                  BCC     MFPS2A          ;BR TO ERROR IF C BIT CLEAR
023606  102402                                  BVS     MFPS2A          ;BR TO ERROR IF V BIT SET
023610  001401                                  BEQ     MFPS2A          ;BR TO ERROR IF Z BIT SET
023612  100404                                  BMI     MFPS2B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
```

```
                                                                    ;          CONDITIONAL BRANCH INST. AND    <====
                                                                    ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;          WHICH FOLLOWS W/ 765            <====
023614                                  MFPS2A:
023614  012742  000560                          MOV     #560,-(R2)  ;MOVE TO MAILBOX #  *******  560  *******
023620  005242                                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
023622  000000                                  HALT                ;COND. CODES INCORRECT
023624  022737  000357  000000  MFPS2B: CMP     #357,@#0    ;CHECK DEST. DATA
023632  001404                                  BEQ     MFPS2C
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;          CONDITIONAL BRANCH INST. AND    <====
                                                                    ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;          WHICH FOLLOWS W/ 755            <====
023634  012742  000561                          MOV     #561,-(R2)  ;MOVE TO MAILBOX #  *******  561  *******
023640  005242                                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
023642  000000                                  HALT                ;DEST. DATA INCORRECT
023644  022700  000001          MFPS2C: CMP     #1,R0       ;CHECK MODE Z REGISTER
023650  001404                                  BEQ     TS245
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;          CONDITIONAL BRANCH INST. AND    <====
                                                                    ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;          WHICH FOLLOWS W/ 746            <====
023652  012742  000562                          MOV     #562,-(R2)  ;MOVE TO MAILBOX #  *******  562  *******
023656  005242                                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
023660  000000                                  HALT                ;MODE 2 REGISTER NOT INCREMENTED 1
                                                                    ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 245          TEST MFPS MODE 3
                                        ;*******************************************************************************
023662  005212                          TS245:  INC     (R2)        ;UPDATE TEST NUMBER
023664  022712  000245                          CMP     #245,(R2)   ;SEQUENCE ERROR?
023670  001033                                  BNE     TS246-10    ;BR TO ERROR HALT ON SEQ ERROR
023672  012700  000406                          MOV     #406,R0     ;R0=406
023676  005037  000000                          CLR     @#0         ;LOC. 0=0
023702  012737  000252  177776                  MOV     #252,@#PS   ;PS=252
023710  106730                                  MFPS    @(R0)+      ;TRY MFPS WITH MODE 3
023712  103403                                  BCS     MFPS3A      ;BR TO ERROR IF C-BIT SET
023714  102402                                  BVS     MFPS3A      ;BR TO ERROR IF V-BIT SET
023716  001401                                  BEQ     MFPS3A      ;BR TO ERROR IF Z-BIT SET
023720  100404                                  BMI     MFPS3B
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;          CONDITIONAL BRANCH INST. AND    <====
                                                                    ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;          WHICH FOLLOWS W/ 763            <====
023722                                  MFPS3A:
023722  012742  000563                          MOV     #563,-(R2)  ;MOVE TO MAILBOX #  *******  563  *******
023726  005242                                  INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
023730  000000                                  HALT                ;CONDITION CODES INCORRECT
023732  022737  125000  000000  MFPS3B: CMP     #125000,@#0 ;CHECK DEST. DATA
023740  001404                                  BEQ     MFPS3C
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;          CONDITIONAL BRANCH INST. AND    <====
                                                                    ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;          WHICH FOLLOWS W/ 753            <====
023742  012742  000564                          MOV     #564,-(R2)  ;MOVE TO MAILBOX #  *******  564  *******
```

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023746  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023750  000000                          HALT                    ;DEST DATA INCORRECT
023752  020027  000410          MFPS3C: CMP     R0,#410         ;CHECK MODE 3 REGISTER.
023756  001404                          BEQ     TS246
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 744             <====
023760  012742  000565                  MOV     #565,-(R2)      ;MOVE TO MAILBOX #  *******  565  *******
023764  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023766  000000                          HALT                    ;MODE 3 REGISTER NOT INCREMENTED BY 2
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;TEST 246               TEST MFPS MODE 4
                                ;*******************************************************************************
023770  005212                  TS246:  INC     (R2)            ;UPDATE TEST NUMBER
023772  022712  000246                  CMP     #246,(R2)       ;SEQUENCE ERROR?
023776  001033                          BNE     TS247-10        ;BR TO ERROR HALT ON SEQ ERROR
024000  012700  000002                  MOV     #2,R0           ;R0=2
024004  005037  000000                  CLR     @#0             ;LOC. 0=0
024010  012737  000125  177776          MOV     #125,@#PS       ;PS=125
024016  106740                          MFPS    -(R0)           ;TRY MFPS W/MODE 4
024020  103003                          BCC     MFPS4A          ;BR TO ERROR IF C-BIT CLEAR
024022  102402                          BVS     MFPS4A          ;BR TO ERROR IF V-BIT SET
024024  001401                          BEQ     MFPS4A          ;BR TO ERROR IF Z-BIT SET
024026  100004                          BPL     MFPS4B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 763             <====
024030                          MFPS4A:
024030  012742  000566                  MOV     #566,-(R2)      ;MOVE TO MAILBOX #  *******  566  *******
024034  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024036  000000                          HALT                    ;COND. CODES INCORRECT
024040  022737  042400  000000  MFPS4B: CMP     #42400,@#0      ;CHECK DEST. DATA
024046  001404                          BEQ     MFPS4C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 753             <====
024050  012742  000567                  MOV     #567,-(R2)      ;MOVE TO MAILBOX #  *******  567  *******
024054  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024056  000000                          HALT                    ;DEST. DATA INCORRECT
024060  020027  000001          MFPS4C: CMP     R0,#1           ;CHECK MODE 4 REGISTER
024064  001404                          BEQ     TS247
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 744             <====
024066  012742  000570                  MOV     #570,-(R2)      ;MOVE TO MAILBOX #  *******  570  *******
024072  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024074  000000                          HALT                    ;MODE 4 REGISTER NOT DECREMENTED BY 1
                                                                ;  OR SEQUENCE ERROR


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

```
                                        ;TEST 247       TEST MFPS MODE 5
                                        ;*****************************************************************************
024076  005212                          TS247:  INC     (R2)            ;UPDATE TEST NUMBER
024100  022712  000247                          CMP     #247,(R2)       ;SEQUENCE ERROR?
024104  001033                                  BNE     TS250-10        ;BR TO ERROR HALT ON SEQ ERROR
024106  012700  000410                          MOV     #410,R0         ;R0=410
024112  012737  177777  000000                  MOV     #-1,@#0         ;LOC. 0=-1
024120  005037  177776                          CLR     @#PS            ;PS=0
024124  106750                                  MFPS    @-(R0)          ;TRY MFPS W/MODE 5
024126  103403                                  BCS     MFPS5A          ;BR TO ERROR IF C-BIT SET
024130  102402                                  BVS     MFPS5A          ;BR TO ERROR IF V-BIT SET
024132  100401                                  BMI     MFPS5A          ;BR TO ERROR IF N-BIT SET
024134  001404                                  BEQ     MFPS5B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 763            <====
024136                                  MFPS5A:
024136  012742  000571                          MOV     #571,-(R2)      ;MOVE TO MAILBOX #  *******  571  *******
024142  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024144  000000                                  HALT                    ;COND. CODES INCORRECT
024146  022737  000377  000000          MFPS5B: CMP     #377,@#0        ;CHECK DEST. DATA
024154  001404                                  BEQ     MFPS5C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 753            <====
024156  012742  000572                          MOV     #572,-(R2)      ;MOVE TO MAILBOX #  *******  572  *******
024162  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024164  000000                                  HALT                    ;DEST DATA INCORRECT
024166  020027  000406                  MFPS5C: CMP     R0,#406         ;CHECK MODE 5 REGISTER
024172  001404                                  BEQ     TS250
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
024174  012742  000573                          MOV     #573,-(R2)      ;MOVE TO MAILBOX #  *******  573  *******
024200  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024202  000000                                  HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
                                                                        ;  OR SEQUENCE ERROR

                                        ;*****************************************************************************
                                        ;TEST 250       TEST MFPS MODE 6
                                        ;*****************************************************************************
024204  005212                          TS250:  INC     (R2)            ;UPDATE TEST NUMBER
024206  022712  000250                          CMP     #250,(R2)       ;SEQUENCE ERROR?
024212  001034                                  BNE     TS251-10        ;BR TO ERROR HALT ON SEQ ERROR
024214  012700  000401                          MOV     #401,R0         ;R0=410
024220  005037  000000                          CLR     @#0             ;LOC. 0=0
024224  012737  000252  177776                  MOV     #252,@#PS       ;PS=252
024232  106760  177377                          MFPS    -401(R0)        ;TRY MFPS W/MODE 6
024236  102403                                  BVS     MFPS6A          ;BR TO ERROR IF V-BIT SET
024240  103402                                  BCS     MFPS6A          ;BR TO ERROR IF C-BIT SET
024242  001401                                  BEQ     MFPS6A          ;BR TO ERROR IF Z-BIT SET
024244  100404                                  BMI     MFPS6B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
```

```
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 762             <====
024246                          MFPS6A:
024246  012742  000574                  MOV     #574,-(R2)      ;MOVE TO MAILBOX #  *******  574  *******
024252  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024254  000000                          HALT                    ;COND. CODES INCORRECT
024256  022737  000252  000000  MFPS6B: CMP     #252,@#0        ;CHECK DEST. DATA
024264  001404                          BEQ     MFPS6C
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 752             <====
024266  012742  000575                  MOV     #575,-(R2)      ;MOVE TO MAILBOX #  *******  575  *******
024272  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024274  000000                          HALT                    ;DEST. DATA INCORRECT
024276  022700  000401          MFPS6C: CMP     #401,R0         ;CHECK DEST. REGISTER
024302  001404                          BEQ     TS251
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 743             <====
024304  012742  000576                  MOV     #576,-(R2)      ;MOVE TO MAILBOX #  *******  576  *******
024310  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024312  000000                          HALT                    ;DEST. DATA INCORRECT
                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 251               TEST MFPS MODE 7
                                ;*******************************************************************************
024314  005212                  TS251:  INC     (R2)            ;UPDATE TEST NUMBER
024316  022712  000251                  CMP     #251,(R2)       ;SEQUENCE ERROR?
024322  001034                          BNE     TS252-10        ;BR TO ERROR HALT ON SEQ ERROR
024324  012700  000777                  MOV     #777,R0         ;R0=777
024330  005037  000000                  CLR     @#0             ;LOC. 0=0
024334  012737  000125  177776          MOV     #125,@#PS       ;PS=125
024342  106770  177407                  MFPS    @-371(R0)       ;TRY MFPS W/MODE 7
024346  102403                          BVS     MFPS7A          ;BR TO ERROR IF V-BIT SET
024350  103002                          BCC     MFPS7A          ;BR TO ERROR IF C-BIT SET
024352  001401                          BEQ     MFPS7A          ;BR TO ERROR IF Z-BIT SET
024354  100004                          BPL     MFPS7B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 762             <====
024356                          MFPS7A:
024356  012742  000577                  MOV     #577,-(R2)      ;MOVE TO MAILBOX #  *******  577  *******
024362  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024364  000000                          HALT                    ;CONDITION CODE INCORRECT
024366  022737  042400  000000  MFPS7B: CMP     #42400,@#0      ;CHECK DESTINATION DATA
024374  001404                          BEQ     MFPS7C
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 752             <====
024376  012742  000600                  MOV     #600,-(R2)      ;MOVE TO MAILBOX #  *******  600  *******
```

```
 024402 005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 024404 000000                          HALT                    ;DEST. DATA INCORRECT
 024406 022700 000777          MFPS7C: CMP     #777,R0         ;CHECK MODE 7 REGISTER
 024412 001404                          BEQ     TS252
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 743             <====
 024414 012742 000601                   MOV     #601,-(R2)      ;MOVE TO MAILBOX # ******* 601 *******
 024420 005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 024422 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
                               ;*******************************************************************************
 024424 005212                 TS252:  INC     (R2)            ;UPDATE TEST NUMBER
 024426 022712 000252                   CMP     #252,(R2)       ;SEQUENCE ERROR?
 024432 001010                          BNE     TS253-10        ;BR TO ERROR HALT ON SEQ ERROR
 024434 012737 000357 177776            MOV     #357,@#PS               ;MOV ONES TO PSW
 024442 000005                          RESET                           ;
 024444 022737 000357 177776            CMP     #357,@#PS               ;PSW CORRECT?
 024452 001404                          BEQ     TS253
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 767             <====
 024454 012742 000602                   MOV     #602,-(R2)      ;MOVE TO MAILBOX # ******* 602 *******
 024460 005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 024462 000000                          HALT                    ;RESET ALTERED PSW
                                                                ;  OR SEQUENCE ERROR
 024464                        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
                               ;*******************************************************************************
 024464 005212                 TS253:  INC     (R2)            ;UPDATE TEST NUMBER
 024466 022712 000253                   CMP     #253,(R2)       ;SEQUENCE ERROR?
 024472 001017                          BNE     TS254-10        ;BR TO ERROR HALT ON SEQ ERROR
 024474 052767 140000 153274            BIS     #USRM,PS                ;SET USER MODE
 024502 012706 000001                   MOV     #1,R6                   ;SET BIT0
 024506 000241                          CLC                             ;CLEAR C-BIT
 024510 006106                 USP1:   ROL     R6                      ;ROTATE 1 POSITION
```

```
024512  103376                          BCC     USP1                            ;BR IF NOT ALL DONE
024514  001407                          BEQ     USP1A                           ;BR IF NO BITS PICKED
024516  042767  140000  153252          BIC     #USRM,PS                        ;CLEAR USER MODE
024524  012742  000603                  MOV     #603,-(R2)              ;MOVE TO MAILBOX #  *******  603  *******
024530  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
024532  000000                          HALT                            ;USER MODE R6 PICKED A BIT
024534  042767  140000  153234  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
                                ;*******************************************************************************
024542  005212                  TS254:  INC     (R2)                    ;UPDATE TEST NUMBER
024544  022712  000254                  CMP     #254,(R2)               ;SEQUENCE ERROR?
024550  001043                          BNE     USP4-10                 ;BR TO ERROR HALT ON SEQ ERROR
024552  052767  140000  153216          BIS     #USRM,PS                        ;SET USER MODE
024560  012706  177777                  MOV     #-1,R6                          ;SET USER R6 TO ALL ONES
024564  022706  177777                  CMP     #-1,R6                          ;READ AND CHECK USER R6
024570  001407                          BEQ     USP2                            ;BR IF NO ERROR
024572  042767  140000  153176          BIC     #USRM,PS                        ;CLEAR USER MODE
024600  012742  000604                  MOV     #604,-(R2)              ;MOVE TO MAILBOX #  *******  604  *******
024604  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
024606  000000                          HALT                            ;USER R6 WILL NOT HOLD ALL ONES
024610  042767  140000  153160  USP2:   BIC     #USRM,PS                        ;SET KERNEL MODE
024616  022706  177777                  CMP     #-1,R6                          ;KERNEL MODE R6 ADDR. FROM USER MODE?>>
024622  001004                          BNE     USP3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND  <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION  <====
                                                                        ;           WHICH FOLLOWS W/ 752          <====
024624  012742  000605                  MOV     #605,-(R2)              ;MOVE TO MAILBOX #  *******  605  *******
024630  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
024632  000000                          HALT                            ;DUAL ADDRESSING ERROR USER/KERNEL R6
024634  005006                  USP3:   CLR     R6                              ;CLEAR KERNEL MODE SP
024636  052767  140000  153132          BIS     #USRM,PS                        ;SET USER MODE
024644  022706  177777                  CMP     #-1,R6                          ;CHECK USER R6 NOT ADDR. FROM KERNEL MODE
024650  042767  140000  153120          BIC     #USRM,PS                        ;CLEAR USER MODE
024656  001404                          BEQ     USP4                            ;BR IF NO ERROR
024660  012742  000606                  MOV     #606,-(R2)              ;MOVE TO MAILBOX #  *******  606  *******
024664  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
024666  000000                          HALT                            ;DUAL ADDRESSING ERROR OR SEQUENCE ERROR
024670  012706  001000          USP4:   MOV     #STBOT,R6                       ;RESTORE SP USER
024674  042767  140000  153074          BIC     #USRM,PS                        ;SET KERNEL MODE
024702  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
                                      ;*******************************************************************************
024706  005212                        TS255:  INC     (R2)                    ;UPDATE TEST NUMBER
024710  022712  000255                        CMP     #255,(R2)               ;SEQUENCE ERROR?
024714  001032                                BNE     TS256-10                ;BR TO ERROR HALT ON SEQ ERROR
024716  012706  001000                        MOV     #STBOT,R6                       ;INITIALIZE KERNEL STACK POINTER
024722  012767  140000  153046                MOV     #USRM,PS                        ;SET USER MODE.PREVIOUS KERNEL
024730  012706  027300                        MOV     #USTBOT,R6                      ;INITIALIZE USER STACK POINTER
024734  006506                                MFPI    R6                              ;TRY MFPI WITH MODE 0
024736  022767  140000  153032                CMP     #140000,PS                      ;CHECK PSW
024744  001407                                BEQ     MFPI0                           ;BR IF NO ERROR
024746  042767  140000  153022                BIC     #USRM,PS                        ;CLEAR USER MODE
024754  012742  000607                        MOV     #607,-(R2)              ;MOVE TO MAILBOX #  *******  607  *******
024760  005242                                INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
024762  000000                                HALT                            ;INCORRECT PSW FROM MFPI
024764  042767  140000  153004        MFPI0:  BIC     #USRM,PS                        ;CLEAR USER MODE
024772  022767  001000  002276                CMP     #STBOT,USTBOT-2                 ;CHECK DATA ON STACK
025000  001404                                BEQ     MFPI0A                          ;BR IF NO ERROR
025002  012742  000610                        MOV     #610,-(R2)              ;MOVE TO MAILBOX #  *******  610  *******
025006  005242                                INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025010  000000                                HALT                            ;INCORRECT DATA FROM MFPI
025012                                MFPI0A:

                                      ;*******************************************************************************
                                      ;TEST 256        TEST MTPI WITH R6 IN MODE 0
                                      ;*******************************************************************************
025012  005212                        TS256:  INC     (R2)                    ;UPDATE TEST NUMBER
025014  022712  000256                        CMP     #256,(R2)               ;SEQUENCE ERROR?
025020  001033                                BNE     TS257-10                ;BR TO ERROR HALT ON SEQ ERROR
025022  005067  152750                        CLR     PS                              ;SET KERNEL MODE
025026  005006                                CLR     R6                              ;INITIALIZE KERNEL R6
025030  012767  140000  152740                MOV     #USRM,PS                        ;SET USER MODE/PREVIOUS KERNEL
025036  012706  027300                        MOV     #USTBOT,R6                      ;INITIALIZE USER STACK POINTER
025042  012746  001000                        MOV     #STBOT,-(R6)                    ;SET UP TARGET DATA
025046  006606                                MTPI    R6                              ;TRY MODE 0 MTPI
025050  022767  140000  152720                CMP     #USRM,PS                        ;CHECK PSW
025056  001407                                BEQ     MTPI0                           ;BR IF NO ERROR
025060  042767  140000  152710                BIC     #USRM,PS                        ;CLEAR USER MODE
025066  012742  000611                        MOV     #611,-(R2)              ;MOVE TO MAILBOX #  *******  611  *******
025072  005242                                INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025074  000000                                HALT                            ;PS INCORRECT FOLLOWING MTPI
025076  005067  152674                MTPI0:  CLR     PS                              ;SET KERNEL MODE
025102  020627  001000                        CMP     R6,#STBOT                       ;CHECK TARGET DATA
025106  001404                                BEQ     TS257
                                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                              ;           WHICH FOLLOWS W/ 744            <====
025110  012742  000612                        MOV     #612,-(R2)              ;MOVE TO MAILBOX #  *******  612  *******
025114  005242                                INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
025116  000000                                HALT                            ;DATA INCORRECT FOLLOWING MTPI
                                                                              ;  OR SEQUENCE ERROR
```

```

                                        ;*******************************************************************************
                                        ;
                                        ;       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
                                        ;*******************************************************************************
025120  005212                          TS257:  INC     (R2)                    ;UPDATE TEST NUMBER
025122  022712  000257                          CMP     #257,(R2)               ;SEQUENCE ERROR?
025126  001062                                  BNE     ER                      ;BR TO ERROR HALT ON SEQ ERROR
025130  012700  027170                  SETUP:  MOV     #BRTAB,R0               ;INITIALIZE BRANCH TABLE POINTER
025134  012704  027226                          MOV     #YNTAB,R4               ;INITIALIZE YES/NO BRANCH MAP POINTER
025140  012767  000017  000142                  MOV     #15.,BRCT               ;INITIALIZE BRANCH TABLE COUNT
025146  012067  000110                  SETBR:  MOV     (R0)+,BRH               ;GET NEXT BRANCH INST.
025152  012401                                  MOV     (R4)+,R1                ;GET NEXT BRANCH MAP
025154  012767  177777  000074                  MOV     #-1,CC1                 ;INITIALIZE CONDITION CODE VALUE
025162  012703  000020                          MOV     #16.,R3                 ;INITIALIZE CONDITION CODE COUNT
025166  005267  000064                  SETCC:  INC     CC1                     ;SET FOR NEXT CC VALUE
025172  032701  100000                          BIT     #100000,R1              ;SEE IF SHOULD BR W/ THESE CC'S
025176  013705  177776                          MOV     @#177776,R5             ;SIMULATE A JNE
025202  042705  177773                          BIC     #177773,R5              ;       (JUMP NOT EQUAL)
025206  000165  025212                          JMP     .+4(R5)                 ;       TO SET2BR
025212  000167  000020                          JMP     SET2BR
025216  012767  025312  000042                  MOV     #CONT,NBR               ;SET TO CONTINUE IF NO BRANCH
025224  012767  025274  000040                  MOV     #ER,YBR                 ;SET TO REPORT ERROR IF BRANCH
025232  000167  000014                          JMP     AROUN                   ;GO AROUND OPPOSITE CONDITION
025236  012767  025274  000022          SET2BR: MOV     #ER,NBR                 ;SET TO REPORT ERROR IF NO BRANCH
025244  012767  025312  000020                  MOV     #CONT,YBR               ;SET TO CONTINUE IF BRANCH
025252  006101                          AROUN:  ROL     R1                      ;UPDATE BIT MAP

025254  012737                                  MOV     (PC)+,@(PC)+            ;SET CONDITION CODE
025256  000000                          CC1:    0                               ;NEW CC VALUE GOES HERE
025260  177776                                  177776
025262  000000                          BRH:    0                               ;BRANCH INST. GOES HERE
025264  000137                                  JMP     @(PC)+                  ;THIS JUMP IF NO BRANCH
025266  000000                          NBR:    0                               ;WHERE TO GO IF NO BRANCH OCCURS
025270  000137                                  JMP     @(PC)+                  ;THIS JUMP IF BRANCH OCCURS
```

```
7952 025272 000000          YBR:   0                        ;WHERE TO GO IF BRANCH OCCURS
7953 025274 012702 000304   ER:    MOV   #$TESTN,R2         ;RESTORE POINTER
7954 025300 012742 000613          MOV   #613,-(R2)         ;MOVE TO MAILBOX #  *******  613  *******
7955 025304 005242                 INC   -(R2)              ;SET MSGTYP TO FATAL ERROR
7956 025306 000000                 HALT                     ;
7957 025310 000000          BRCT:  0
7958 025312 005303          CONT:  DEC   R3                 ;CC'S DONE?
7959 025314 013705 177776          MOV   @#177776,R5        ;SIMULATE A JNE
7960 025320 042705 177773          BIC   #177773,R5         ;       (JUMP NOT EQUAL)
7961 025324 000165 025330          JMP   .+4(R5)            ;       TO SETCC
7962 025330 000167 177632          JMP   SETCC
7963 025334 005367 177750          DEC   BRCT               ;BR'S DONE?
7964 025340 013705 177776          MOV   @#177776,R5        ;SIMULATE A JNE
7965 025344 042705 177773          BIC   #177773,R5         ;       (JUMP NOT EQUAL)
7966 025350 000165 025354          JMP   .+4(R5)            ;       TO SETBR
7967 025354 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
                                     ;*******************************************************************************
025360  005212                       TS260:  INC     (R2)            ;UPDATE TEST NUMBER
025362  022712  000260                       CMP     #260,(R2)       ;SEQUENCE ERROR?
025366  001052                               BNE     DAERR           ;BR TO ERROR HALT ON SEQ ERROR
025370  005000                       BITCLR: CLR     R0              ;INITIALIZE ALL REGISTERS
025372  005001                               CLR     R1
025374  005002                               CLR     R2
025376  005003                               CLR     R3
025400  005004                               CLR     R4
025402  005005                               CLR     R5
025404  005006                               CLR     R6
025406  052700  000001               BITSET: BIS     #1,R0           ;SET R0=1
025412  052701  000002                       BIS     #2,R1           ;R1=2
025416  052702  000004                       BIS     #4,R2           ;R2=4
025422  052703  000010                       BIS     #10,R3          ;R3=10
025426  052704  000020                       BIS     #20,R4          ;R4=20
025432  052705  000040                       BIS     #40,R5          ;R5=40
025436  052706  000100                       BIS     #100,R6         ;R6=100
025442  022706  000100               BITCHK: CMP     #100,R6         ;TEST THAT NO DUAL ADDRESSING OCCURRED
025446  001022                               BNE     DAERR           ;BR TO ERROR HALT IF ANY OTHER BITS ARE SET
025450  022705  000040                       CMP     #40,R5
025454  001017                               BNE     DAERR
025456  022704  000020                       CMP     #20,R4
025462  001014                               BNE     DAERR
025464  022703  000010                       CMP     #10,R3
025470  001011                               BNE     DAERR
025472  022702  000004                       CMP     #4,R2
025476  001006                               BNE     DAERR
025500  022701  000002                       CMP     #2,R1
025504  001003                               BNE     DAERR
025506  022700  000001                       CMP     #1,R0
025512  001404                               BEQ     BITCON
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                     ;           CONDITIONAL BRANCH INST. AND     <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                     ;           WHICH FOLLOWS W/ 725             <====
025514                               DAERR:
025514  012742  000614                       MOV     #614,-(R2)      ;MOVE TO MAILBOX #  *******  614  *******
025520  005242                               INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025522  000000                               HALT                    ;DUAL ADDRESSING ERROR
025524  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
                                        ;*******************************************************************************
025530  005212                          TS261:  INC     (R2)            ;UPDATE TEST NUMBER
025532  022712  000261                          CMP     #261,(R2)       ;SEQUENCE ERROR?
025536  001012                                  BNE     BTERR           ;BR TO ERROR HALT ON SEQ ERROR
025540  052737  170357  177776                  BIS     #170357,@#PS    ;SET ALL POSSIBLE BITS IN PSW
025546  105037  177776                          CLRB    @#PS            ;CLR PR LEVEL AND CC'S
025552  013700  177776                          MOV     @#PS,R0         ;COPY CONTENTS OF PSW
025556  032700  170000                          BIT     #170000,R0      ;TEST THAT UPPER BYTE IS UNAFFECTED
025562  001006                                  BNE     BTCON           ;CONTINUE IF OK
025564  005037  177776                  BTERR:  CLR     @#PS            ;RETURN TO KERNEL MODE
025570  012742  000615                          MOV     #615,-(R2)      ;MOVE TO MAILBOX #  *******  615  *******
025574  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025576  000000                                  HALT                    ;BYTE INSTRUCTION ALTERED PSW
025600  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
                                        ;*******************************************************************************
025604  005212                          TS262:  INC     (R2)            ;UPDATE TEST NUMBER
025606  022712  000262                          CMP     #262,(R2)       ;SEQUENCE ERROR?
025612  001010                                  BNE     TS263-10        ;BR TO ERROR HALT ON SEQ ERROR
025614  000277                                  SCC
025616  000252                                  +CLN!CLV                ;CC=0101
025620  000167  000000                          JMP     JMPT            ;JUMP TO TEST PSW
025624  100403                          JMPT:   BMI     JMPERR          ;BR TO ERROR HALT IF N-BIT IS SET
025626  001002                                  BNE     JMPERR          ;BR TO ERROR HALT IF Z-BIT IS CLEAR
025630  102401                                  BVS     JMPERR          ;BR TO ERROR HALT IF V-BIT IF SET
025632  103404                                  BCS     TS263
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 767           <====
025634                                  JMPERR:
025634  012742  000616                          MOV     #616,-(R2)      ;MOVE TO MAILBOX #  *******  616  *******
025640  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025642  000000                                  HALT                    ;JMP INSTRUCTION AFFECTED CC'S
                                                                        ;  OR SEQUENCE ERROR
```

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                                        ;*******************************************************************************
                                        ;
                                        ;       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
                                        ;*******************************************************************************
 025644  005212                         TS263:  INC     (R2)            ;UPDATE TEST NUMBER
 025646  022712  000263                         CMP     #263,(R2)       ;SEQUENCE ERROR?
 025652  001062                                 BNE     CCERR           ;BR TO ERROR HALT ON SEQ ERROR
 025654  012767  000240  000024                 MOV     #240,CC3        ;INITIALIZE CLR CC INSTRUCTION CODES
 025662  012767  000017  000032                 MOV     #17,CC2         ;INITIALIZE OCTAL MAP
 025670  012767  000261  000102                 MOV     #261,SC3        ;INITIALIZE SET CC INSTRUCTION CODES
 025676  012767  000001  000110                 MOV     #1,SC4          ;INITIALIZE OCTAL MAP
 025704  000277                         CLRCD:  SCC                     ;SET ALL CONDITION CODES
 025706  000000                         CC3:    0                       ;CONDITION CODE INSTRUCTION
 025710  013704  177776                         MOV     @#PS,R4         ;COPY THE PSW
 025714  042704  177760                         BIC     #177760,R4      ;ISOLATE CONDITION CODES
 025720  022704                                 CMP     (PC)+,R4        ;CHECK THAT PROPER CC'S WERE CLEARED
 025722  000000                         CC2:    0                       ;OCTAL REPRESENTATION OF CC'S
 025724  001404                                 BEQ     CON1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 752            <====
 025726  012742  000617                         MOV     #617,-(R2)      ;MOVE TO MAILBOX #  *******  617  *******
 025732  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 025734  000000                                 HALT                    ;CLEAR CC INSTRUCTION FAILED
 025736  005367  177760                 CON1:   DEC     CC2             ;SET NEXT OCTAL MAP OF CC'S
 025742  005267  177740                         INC     CC3             ;GET NEXT CLEAR CC INSTRUCTION
 025746  026727  177734  000257                 CMP     CC3,#257        ;TEST FOR CCC INSTRUCTION
 025754  003753                                 BLE     CLRCD           ;GO TEST NEXT INSTRUCTION IF NOT FOUND
 025756  026727  177724  000260                 CMP     CC3,#260        ;CHECK FOR NOP=260
 025764  001004                                 BNE     SETCD           ;GO TEST SET CC INSTRUCTIONS
 025766  012767  000017  177726                 MOV     #17,CC2         ;SET OCTAL MAP TO TEST NOP
 025774  000743                                 BR      CLRCD           ;GO TEST NOP
 025776  000257                         SETCD:  CCC                     ;CLEAR ALL CONDITION CODES
 026000  000000                         SC3:    0                       ;CONDITION CODE INSTRUCTION
 026002  013704  177776                         MOV     @#PS,R4         ;COY PSW
 026006  042704  177760                         BIC     #177760,R4      ;CLEAR AWAY UNWANTED BITS
 026012  022704                                 CMP     (PC)+,R4        ;CHECK THAT PROPER CC'S WERE SET
 026014  000000                         SC4:    0                       ;OCTAL REPRESENTATION OF CC'S
 026016  001404                                 BEQ     CON2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
```

```
                                                        ;               WHICH FOLLOWS W/ 715          <====
026020                          CCERR:
026020  012742  000620                  MOV     #620,-(R2)      ;MOVE TO MAILBOX #  *******  620  *******
026024  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026026  000000                          HALT                    ;SET CC FAILED OR SEQUENCE ERROR
026030  005267  177760          CON2:   INC     SC4             ;SET NEXT OCTAL MAP
026034  005267  177740                  INC     SC3             ;PREPARE NEXT SET CC INSTRUCTION
026040  026727  177734  000277          CMP     SC3,#277        ;FINISHED?
026046  003753                          BLE     SETCD           ;BR IF NO
026050  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.
                                      ;
026054  000000  000000  000000        A:      .WORD 0,0,0
026062                                MOR0:
                                      ;*************************************************************************
                                      ;TEST 264        TEST AUTO-INCREMENT MODE, USING R0
                                      ;*************************************************************************
026062  005212                        TS264:  INC     (R2)            ;UPDATE TEST NUMBER
026064  022712  000264                        CMP     #264,(R2)       ;SEQUENCE ERROR?
026070  001020                                BNE     TS265-10        ;BR TO ERROR HALT ON SEQ ERROR
026072  005037  026054                        CLR     @#A             ;CLEAR LOC A
026076  012700  026054                        MOV     #A,R0           ;R0 STORES ADDR OF A
026102  060020                                ADD     R0,(R0)+        ;CHECK THAT R0 IS INCR BY 2 BEFORE
                                                                      ;BEING USED AS THE SOURCE OPERAND
026104  022700  026056                        CMP     #A+2,R0         ;R0 INCR BY 2?
026110  001404                                BEQ     MOR1
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                      ;           CONDITIONAL BRANCH INST. AND   <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                      ;           WHICH FOLLOWS W/ 767           <====
026112  012742  000621                        MOV     #621,-(R2)      ;MOVE TO MAILBOX #  *******  621  *******
026116  005242                                INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026120  000000                                HALT                    ;R0 WAS NOT INCREMENTED BY 2
                                                                      ;
026122  022737  026056  026054        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)?
026130  001404                                BEQ     TS265
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                      ;           CONDITIONAL BRANCH INST. AND   <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                      ;           WHICH FOLLOWS W/ 757           <====
026132  012742  000622                        MOV     #622,-(R2)      ;MOVE TO MAILBOX #  *******  622  *******
026136  005242                                INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026140  000000                                HALT                    ;WRONG SUM IN LOC A
                                                                      ;  OR SEQUENCE ERROR

                                      ;*************************************************************************
                                      ;TEST 265        AUTO-DECREMENT MODE, USING R0
                                      ;*************************************************************************
026142  005212                        TS265:  INC     (R2)            ;UPDATE TEST NUMBER
026144  022712  000265                        CMP     #265,(R2)       ;SEQUENCE ERROR?
026150  001020                                BNE     TS266-10        ;BR TO ERROR HALT ON SEQ ERROR
026152  005037  026054                        CLR     @#A             ;CLEAR LOC A
026156  012700  026056                        MOV     #A+2,R0         ;R0 STORES ADDR OF A+2
026162  060040                                ADD     R0,-(R0)        ;CHECK THAT R0 IS DECR BY 2 BEFORE
                                                                      ;BEING USED AS THE SOURCE OPERAND
026164  022700  026054                        CMP     #A,R0           ;R0 DECR BY 2?
026170  001404                                BEQ     MOR2
```

```
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
                                                      ;           WHICH FOLLOWS W/ 767             <====
026172 012742 000623                 MOV   #623,-(R2)  ;MOVE TO MAILBOX #  *******  623  *******
026176 005242                        INC   -(R2)       ;SET MSGTYP TO FATAL ERROR
026200 000000                        HALT              ;R0 WAS NOT DECREMENTED BY 2
                                                      ;
026202 022737 026054 026054 MOR2:    CMP   #A,@#A      ;CONTENT OF R0 WAS DECR BY 2 BEFORE
                                                      ;BEING USED IN THE ''ADD'' INSTR
                                                      ;LOC A CONTAINS (R0)
026210 001404                        BEQ   TS266
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
                                                      ;           WHICH FOLLOWS W/ 757             <====
026212 012742 000624                 MOV   #624,-(R2)  ;MOVE TO MAILBOX #  *******  624  *******
026216 005242                        INC   -(R2)       ;SET MSGTYP TO FATAL ERROR
026220 000000                        HALT              ;WRONG SUM IN LOC A
                                                      ;  OR SEQUENCE ERROR
                                                      ;
                            ;*****************************************************************************************
                            ;TEST 266        TEST AUTO-INCREMENT DEFERRED MODE, USING R0
                            ;*****************************************************************************************
026222 005212               TS266:   INC   (R2)        ;UPDATE TEST NUMBER
026224 022712 000266                 CMP   #266,(R2)   ;SEQUENCE ERROR?
026230 001044                        BNE   TS267-10    ;BR TO ERROR HALT ON SEQ ERROR
026232 005037 026054                 CLR   @#A         ;CLEAR LOC A
026236 005037 026060                 CLR   @#A+4       ;CLEAR LOC A+4
026242 012737 026054 026056          MOV   #A,@#A+2    ;STORE ADDR A IN LOC A+2
026250 012700 026056                 MOV   #A+2,R0     ;R0 STORES ADDR A+2
026254 060030                        ADD   R0,@(R0)+   ;CHECK THAT R0 IS INCR BY 2 BEFORE
                                                      ;BEING USED AS THE SOURCE OPERAND
026256 022700 026060                 CMP   #A+4,R0     ;R0 INCR BY 2?
026262 001404                        BEQ   MOR3
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
                                                      ;           WHICH FOLLOWS W/ 762             <====
026264 012742 000625                 MOV   #625,-(R2)  ;MOVE TO MAILBOX #  *******  625  *******
026270 005242                        INC   -(R2)       ;SET MSGTYP TO FATAL ERROR
026272 000000                        HALT              ;R0 WAS NOT INCREMENTED BY 2
                                                      ;
026274 022737 026054 026056 MOR3:    CMP   #A,@#A+2    ;LOC A+2 STILL STORES ADDR A?
026302 001404                        BEQ   MOR4
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
                                                      ;           WHICH FOLLOWS W/ 752             <====
026304 012742 000626                 MOV   #626,-(R2)  ;MOVE TO MAILBOX #  *******  626  *******
026310 005242                        INC   -(R2)       ;SET MSGTYP TO FATAL ERROR
026312 000000                        HALT              ;LOC A+2 STORES WRONG DATA
                                                      ;
026314 022737 026060 026054 MOR4:    CMP   #A+4,@#A    ;CHECK CONTENT OF R0 WAS INCR BY 2 BEFORE
                                                      ;BEING USED IN THE ''ADD'' INSTR
026322 001404                        BEQ   MOR5
```

```
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 742             <====
026324  012742  000627                  MOV     #627,-(R2)      ;MOVE TO MAILBOX #  *******  627  *******
026330  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026332  000000                          HALT                    ;LOC A STORES WRONG DATA
                                                        ;
026334  005737  026060          MOR5:   TST     @#A+4           ;LOC A+4 STILL STORES 0?
026340  001404                          BEQ     TS267
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 733             <====
026342  012742  000630                  MOV     #630,-(R2)      ;MOVE TO MAILBOX #  *******  630  *******
026346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026350  000000                          HALT                    ;LOC A+4 DID NOT STAY CLEAR
                                                        ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 267       TEST AUTO-DECREMENT DEFERRED, USING R0
                                ;*******************************************************************************
026352  005212                  TS267:  INC     (R2)            ;UPDATE TEST NUMBER
026354  022712  000267                  CMP     #267,(R2)       ;SEQUENCE ERROR?
026360  001044                          BNE     TS270-10        ;BR TO ERROR HALT ON SEQ ERROR
026362  005037  026054                  CLR     @#A             ;CLEAR LOC A
026366  005037  026060                  CLR     @#A+4           ;CLEAR LOC A+4
026372  012700  026060                  MOV     #A+4,R0         ;R0 STORES ADDR A+4
026376  012737  026054  026056          MOV     #A,@#A+2        ;STORE ADDR A IN LOC A+2
026404  060050                          ADD     R0,@-(R0)       ;CHECK THAT R0 IS DECR BY 2 BEFORE
                                                        ;BEING USED AS THE SOURCE OPERAND
026406  022700  026056                  CMP     #A+2,R0         ;R0 DECREMENTFD BY 2?
026412  001404                          BEQ     MOR6
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 762             <====
026414  012742  000631                  MOV     #631,-(R2)      ;MOVE TO MAILBOX #  *******  631  *******
026420  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026422  000000                          HALT                    ;R0 WAS NOT DECREMENTED BY 2
                                                        ;
026424  022737  026056  026054  MOR6:   CMP     #A+2,@#A        ;CHECK CONTENT OF R0 WAS DECR BY 2 BEFORE
                                                        ;BEING USED IN THE ''ADD'' INSTR
026432  001404                          BEQ     MOR7
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 752             <====
026434  012742  000632                  MOV     #632,-(R2)      ;MOVE TO MAILBOX #  *******  632  *******
026440  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026442  000000                          HALT                    ;LOC A STORES WRONG DATA

                                                        ;
026444  022737  026054  026056  MOR7:   CMP     #A,@#A+2        ;LOC A+2 STILL STORES A?
026452  001404                          BEQ     MOR8
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
```

```
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 742             <====
026454  012742  000633          MOV     #633,-(R2)      ;MOVE TO MAILBOX #  *******  633  *******
026460  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026462  000000                  HALT                    ;LOC A+2 STORES WRONG DATA
                                                        ;
026464  005737  026060  MOR8:   TST     @#A+4           ;LOC A+4 STILL STORES 0?
026470  001404                  BEQ     TS270
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 733             <====
026472  012742  000634          MOV     #634,-(R2)      ;MOVE TO MAILBOX #  *******  634  *******
026476  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026500  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
                                     ;*************************************************************************
026502  005212                       TS270:  INC     (R2)            ;UPDATE TEST NUMBER
026504  022712  000270                       CMP     #270,(R2)       ;SEQUENCE ERROR?
026510  001006                               BNE     TS271-10        ;BR TO ERROR HALT ON SEQ ERROR
026512  012700  177777                       MOV     #-1,R0          ;SET ALL 1 IN R0
026516  010700                       PCN01:  MOV     PC,R0           ;STORES PC IN R0
026520  022700  026520                       CMP     #PCN01+2,R0     ;R0 STORES PC+2?
026524  001404                               BEQ     TS271
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                     ;           CONDITIONAL BRANCH INST. AND   <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                     ;           WHICH FOLLOWS W/ 771           <====
026526  012742  000635                       MOV     #635,-(R2)      ;MOVE TO MAILBOX #  *******  635  *******
026532  005242                               INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026534  000000                               HALT                    ;R0 STORED WRONG VALUE
                                                                     ;  OR SEQUENCE ERROR

                                     ;*************************************************************************
                                     ;TEST 271        TEST PC AS SOURCE IN MODE 6, USING R0
                                     ;*************************************************************************
026536  005212                       TS271:  INC     (R2)            ;UPDATE TEST NUMBER
026540  022712  000271                       CMP     #271,(R2)       ;SEQUENCE ERROR?
026544  001010                               BNE     TS272-10        ;BR TO ERROR HALT ON SEQ ERROR
026546  012700  026054                       MOV     #A,R0           ;R0 STORES ADDR A
026552  010760  000004               PCN2:   MOV     PC,4(R0)                ;EFFECTIVE ADDR IS A+4
026556  022737  026556  026060               CMP     #PCN2+4,@#A+4   ;LOC A+4 STORES PC+4?
026564  001404                               BEQ     TS272
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                     ;           CONDITIONAL BRANCH INST. AND   <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                     ;           WHICH FOLLOWS W/ 767           <====
026566  012742  000636                       MOV     #636,-(R2)      ;MOVE TO MAILBOX #  *******  636  *******
026572  005242                               INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026574  000000                               HALT                    ;LOC A+4 STORED WRONG VALUE
                                                                     ;  OR SEQUENCE ERROR

                                     ;*************************************************************************
                                     ;TEST 272        TEST PC AS SOURCE IN MODE 7, USING R0
                                     ;*************************************************************************
026576  005212                       TS272:  INC     (R2)            ;UPDATE TEST NUMBER
026600  022712  000272                       CMP     #272,(R2)       ;SEQUENCE ERROR?
026604  001013                               BNE     TS273-10        ;BR TO ERROR HALT ON SEQ ERROR
026606  012737  026054  026060               MOV     #A,@#A+4        ;LOC A+4 STORES ADDR A
026614  012700  026054                       MOV     #A,R0           ;R0 STORES ADDR A
026620  010770  000004               PCN3:   MOV     PC,@4(R0)       ;EFFECTIVE ADDR IS A
026624  022737  026624  026054               CMP     #PCN3+4,@#A     ;LOC A STORES PC+4?
026632  001404                               BEQ     TS273
```

```
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                          ;           CONDITIONAL BRANCH INST. AND   <====
                                                          ;           REPLACE THE MOVE INSTRUCTION   <====
                                                          ;           WHICH FOLLOWS W/ 764           <====
026634  012742  000637                  MOV     #637,-(R2)      ;MOVE TO MAILBOX #  *******  637  *******
026640  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026642  000000                          HALT                    ;LOC A STORED WRONG VALUE
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 273       TEST PC AS SOURCE IN RELATIVE DEFERRED MODE ,USING RO
                                ;*******************************************************************************
026644  005212                  TS273:  INC     (R2)            ;UPDATE TEST NUMBER
026646  022712  000273                  CMP     #273,(R2)       ;SEQUENCE ERROR?
026652  001011                          BNE     TS274-10        ;BR TO ERROR HALT ON SEQ ERROR
026654  012737  026056  026054          MOV     #A+2,@#A        ;LOC A STORES ADDR A+2
026662  010777  177166          PCN4:   MOV     PC,@A           ;EFFECTIVE ADDR IS A+2
026666  022737  026666  026056          CMP     #PCN4+4,@#A+2   ;LOC A+2 STORES PC+4?
026674  001404                          BEQ     TS274
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                          ;           CONDITIONAL BRANCH INST. AND   <====
                                                          ;           REPLACE THE MOVE INSTRUCTION   <====
                                                          ;           WHICH FOLLOWS W/ 766           <====
026676  012742  000640                  MOV     #640,-(R2)      ;MOVE TO MAILBOX #  *******  640  *******
026702  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026704  000000                          HALT                    ;LOC A+2 STORED WRONG VALUE
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 274       TEST PC AS SOURCE IN RELATIVE MODE ,USING RO
                                ;*******************************************************************************
026706  005212                  TS274:  INC     (R2)            ;UPDATE TEST NUMBER
026710  022712  000274                  CMP     #274,(R2)       ;SEQUENCE ERROR?
026714  001010                          BNE     TS275-10        ;BR TO ERROR HALT ON SEQ ERROR
026716  005037  026054                  CLR     @#A             ;CLEAR A
026722  010767  177126          PCN5:   MOV     PC,A            ;EFFECTIVE ADDR IS A
026726  022737  026726  026054          CMP     #PCN5+4,@#A     ;LOC A STORES PC+4?
026734  001404                          BEQ     TS275
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                          ;           CONDITIONAL BRANCH INST. AND   <====
                                                          ;           REPLACE THE MOVE INSTRUCTION   <====
                                                          ;           WHICH FOLLOWS W/ 767           <====
026736  012742  000641                  MOV     #641,-(R2)      ;MOVE TO MAILBOX #  *******  641  *******
026742  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026744  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
                                ;*******************************************************************************
026746  005212                  TS275:  INC     (R2)            ;UPDATE TEST NUMBER
026750  022712  000275                  CMP     #275,(R2)       ;SEQUENCE ERROR?
026754  001013                          BNE     TS276-10        ;BR TO ERROR HALT ON SEQ ERROR
026756  012737  052525  000000          MOV     #052525,@#0     ;SET UP LOC 0
```

```
026764  012701  050505                  MOV     #050505,R1      ;SET UP R1
026770  005000                          CLR     R0              ;CLEAR R0
026772  160120                          SUB     R1,(R0)+        ;SUBTRACTION, SM=0,DM=2
026774  022737  002020  000000          CMP     #2020,@#0       ;CHECK DIFFERENCE AT LOC 0
027002  001404                          BEQ     TS276
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND     <====
                                                                ;          REPLACE THE MOVE INSTRUCTION     <====
                                                                ;          WHICH FOLLOWS W/ 764             <====
027004  012742  000642                  MOV     #642,-(R2)      ;MOVE TO MAILBOX #  *******  642  *******
027010  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027012  000000                          HALT                    ;WRONG RESULT FROM SUBTRACTION
                                                                ;  OR SEQUENCE ERROR


                                ;***********************************************************************
                                ;TEST 276       TEST MFPD WITH R0, IN MODE 2
                                ;***********************************************************************
027014  005212                  TS276:  INC     (R2)            ;UPDATE TEST NUMBER
027016  022712  000276                  CMP     #276,(R2)       ;SEQUENCE ERROR?
027022  001020                          BNE     TS277-10        ;BR TO ERROR HALT ON SEQ ERROR
027024  012737  052525  000000          MOV     #052525,@#0     ;SET UP LOC 0
027032  005000                          CLR     R0              ;CLEAR R0
027034  012767  170000  150734          MOV     #170000,PS      ;SET USER MODE ON, CURRENT & PREVIOUS
027042  012706  027300                  MOV     #USTBOT,R6      ;SET USER STACK POINTER
027046  106520                          MFPD    (R0)+           ;MODE 2, MFPD
027050  005067  150722                  CLR     PS              ;SET KERNEL MODE
027054  022767  052525  000214          CMP     #052525,USTBOT-2        ;CHECK DATA ON STACK
027062  001404                          BEQ     BRMFPD          ;BR IF NO ERROR
027064  012742  000643                  MOV     #643,-(R2)      ;MOVE TO MAILBOX #  *******  643  *******
027070  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027072  000000                          HALT                    ;INCORRECT DATA FROM MFPD
027074                          BRMFPD:

                                ;***********************************************************************
                                ;TEST 277       TEST MTPD WITH R0, IN MODE 2
                                ;***********************************************************************
027074  005212                  TS277:  INC     (R2)            ;UPDATE TEST NUMBER
027076  022712  000277                  CMP     #277,(R2)       ;SEQUENCE ERROR?
027102  001026                          BNE     END1            ;BR TO ERROR HALT ON SEQ ERROR
027104  012767  170000  150664          MOV     #170000,PS      ;SET USER MODE ON, CURRENT & PREVIOUS
027112  012706  027300                  MOV     #USTBOT,R6      ;SET USER STACK POINTER
027116  012746  125252                  MOV     #125252,-(R6)   ;PUSH DATA IN USER STACK
027122  012737  000000  000000          MOV     #0,@#0          ;CLEAR LOC 0
027130  005000                          CLR     R0              ;CLEAR R0
027132  106620                          MTPD    (R0)+           ;MODE 2, MTPD
027134  005067  150636                  CLR     PS              ;SET KERNEL MODE
027140  022737  125252  000000          CMP     #125252,@#0     ;CHECK DATA ON LOC 0
027146  001514                          BEQ     SECPRT          ;BR TO TRAP TEST IF NO ERROR
027150  012742  000644                  MOV     #644,-(R2)      ;MOVE TO MAILBOX #  *******  644  *******
027154  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027156  000000                          HALT                    ;INCORRECT DATA FROM MTPD
027160                          END1:
027160  012742  000645                  MOV     #645,-(R2)      ;MOVE TO MAILBOX #  *******  645  *******
027164  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027166  000000                          HALT                    ;SEQUENCE ERROR
```

```

027170  000402                 BRTAB:  BR      .+6
027172  001002                         BNE     .+6
027174  001402                         BEQ     .+6
027176  002002                         BGE     .+6
027200  002402                         BLT     .+6
027202  003002                         BGT     .+6
027204  003402                         BLE     .+6
027206  100002                         BPL     .+6
027210  100402                         BMI     .+6
027212  101002                         BHI     .+6
027214  101402                         BLOS    .+6
027216  102002                         BVC     .+6
027220  102402                         BVS     .+6
027222  103002                         BCC     .+6                     ;SAME AS BHIS
027224  103402                         BCS     .+6                     ;SAME AS BLO

        000002                 .RADIX  2
027226  177777                 YNTAB:  1111111111111111                ;BR
027230  170360                         1111000011110000                ;BNE:   Z=0
027232  007417                         0000111100001111                ;BEQ:   Z=1
027234  146063                         1100110000110011                ;BGE:   N XOR V =0
027236  031714                         0011001111001100                ;BLT:   N XOR V =1
027240  140060                         1100000000110000                ;BGT:   Z+(N XOR V) =0
027242  037717                         0011111111001111                ;BLE:   Z+(N XOR V) =1

027244  177400                         1111111100000000                ;BPL:   N=0
027246  000377                         0000000011111111                ;BMI:   N=1
027250  120240                         1010000010100000                ;BHI:   C+Z=0
027252  057537                         0101111101011111                ;BLOS:  C+Z=1
027254  146314                         1100110011001100                ;BVC:   V=0
027256  031463                         0011001100110011                ;BVS:   V=1
027260  125252                         1010101010101010                ;BCC:   C=0
027262  052525                         0101010101010101                ;BCS:   C=1
        000010                 .RADIX  8

                               .EVEN
027264  000006                 .BLKW   6
027300                         USTBOT:
                               ;*************************************************************************
                               ; THE FOLLOWING ARE SPECIAL CPU TRAP
                               ;HANDLERS TO TRAP AND REPORT SPECIAL TRAPS.
                               ;
                               ;*************************************************************************

027300                         T04:
027300  012742  000646                 MOV     #646,-(R2)              ;MOVE TO MAILBOX #  *******  646  *******
027304  005242                         INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
027306  000000                         HALT                            ;TRAPPED THRU LOC. 4
027310                         T010:
027310  012742  000647                 MOV     #647,-(R2)              ;MOVE TO MAILBOX #  *******  647  *******
027314  005242                         INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
027316  000000                         HALT                            ;TRAPPED THRU LOC. 10
027320                         T014:
027320  012742  000650                 MOV     #650,-(R2)              ;MOVE TO MAILBOX #  *******  650  *******
027324  005242                         INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
```

```
027326  000000                        HALT                        ;TRAPPED THRU LOC. 14
027330                        T030:
027330  012742  000651                MOV     #651,-(R2)          ;MOVE TO MAILBOX #  *******  651  *******
027334  005242                        INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027336  000000                        HALT                        ;TRAPPED THRU LOC. 30
027340                        T034:
027340  012742  000652                MOV     #652,-(R2)          ;MOVE TO MAILBOX #  *******  652  *******
027344  005242                        INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027346  000000                        HALT                        ;TRAPPED THRU LOC. 34
027350                        T0114:
027350  012742  000653                MOV     #653,-(R2)          ;MOVE TO MAILBOX #  *******  653  *******
027354  005242                        INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027356  000000                        HALT                        ;TRAPPED THRU LOC. 114
027360                        T0244:
027360  012742  000654                MOV     #654,-(R2)          ;MOVE TO MAILBOX #  *******  654  *******
027364  005242                        INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027366  000000                        HALT                        ;TRAPPED THRU LOC. 244
027370                        T0250:
027370  012742  000655                MOV     #655,-(R2)          ;MOVE TO MAILBOX #  *******  655  *******
027374  005242                        INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027376  000000                        HALT                        ;TRAPPED THRU LOC. 250
                              .SBTTL ** STARTING OF TRAP TEST **
027400                        SECPRT:
```

```
        000000                  .REPT 0

                                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

027400  000167  000024                  JMP     TESTN1
027404  000000                  K1:     0
027406  000000                  K2:     0
027410  000000                  K3:     0
027412  000000                  K4:     0
027414  000000                  K5:     0
027416  000000                  K6:     0
027420  052525                  K7:     052525
027422  052400                  K10:    052400
027424  000000                  K11:    0
027426  000000                  K12:    0

027430                          TESTN1:
                                ;*****************************************************************************
                                ;TEST 300       TEST AUTO INCREMENT AND DECREMENT OF R6 FOR WORD AND BYTES
                                ;*****************************************************************************
027430  005212                  TS300:  INC     (R2)            ;UPDATE TEST NUMBER
027432  022712  000300                  CMP     #300,(R2)       ;SEQUENCE ERROR?
027436  001127                          BNE     TS301-10        ;BR TO ERROR HALT ON SEQ ERROR
027440  005006                          CLR     %6
027442  112667  150332                  MOVB    (6)+,HERE       ;SIX SHOULD INCREMENT BY TWO
027446  020627  000002                  CMP     %6,#2
027452  001404                          BEQ     BR1
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 771              <====
027454  012742  000656                  MOV     #656,-(R2)      ;MOVE TO MAILBOX #  *******  656  *******
027460  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027462  000000                          HALT                    ;R6 DID NOT AUTO INCREMENT BY TWO

027464  012706  001000          BR1:    MOV     #1000,%6
027470  114627  000000                  MOVB    -(6),#HERE      ;SHOULD DECREMENT BY TWO
027474  020627  000776                  CMP     %6,#776
027500  001404                          BEQ     BR2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 756              <====
027502  012742  000657                  MOV     #657,-(R2)      ;MOVE TO MAILBOX #  *******  657  *******
027506  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027510  000000                          HALT                    ;R6 DID NOT AUTO DECREMENT BY 2

027512  005006                  BR2:    CLR     %6
027514  112626                          MOVB    (6)+,(6)+       ;DOUBLES AUTO INCREMENT OF R6
027516  020627  000004                  CMP     %6,#4
027522  001404                          BEQ     BR3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 745              <====
027524  012742  000660                  MOV     #660,-(R2)      ;MOVE TO MAILBOX #  *******  660  *******
```

```
027530 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027532 000000                  HALT                    ;WRONG AUTO INCREMENT OF R6

027534 005006          BR3:    CLR     %6
027536 005004                  CLR     %4
027540 122624                  CMPB    (6)+,(4)+       ;TEST INCREMENT OF R6
027542 020627 000002           CMP     %6,#2
027546 001404                  BEQ     BR4
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                       ;           CONDITIONAL BRANCH INST. AND     <====
                                                       ;           REPLACE THE MOVE INSTRUCTION     <====
                                                       ;           WHICH FOLLOWS W/ 733             <====
027550 012742 000661           MOV     #661,-(R2)      ;MOVE TO MAILBOX #  *******  661  *******
027554 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027556 000000                  HALT                    ;WRONG INCREMENT OF R6

027560 005006          BR4:    CLR     %6
027562 005004                  CLR     %4
027564 122426                  CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
027566 020627 000002           CMP     %6,#2
027572 001404                  BEQ     BR5
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                       ;           CONDITIONAL BRANCH INST. AND     <====
                                                       ;           REPLACE THE MOVE INSTRUCTION     <====
                                                       ;           WHICH FOLLOWS W/ 721             <====
027574 012742 000662           MOV     #662,-(R2)      ;MOVE TO MAILBOX #  *******  662  *******
027600 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027602 000000                  HALT                    ;WRONG INCREMENT OF R6

027604 005006          BR5:    CLR     %6
027606 005004                  CLR     %4
027610 122624                  CMPB    (6)+,(4)+       ;TEST INCREMENT OF R4
027612 020427 000001           CMP     %4,#1
027616 001404                  BEQ     BR6
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                       ;           CONDITIONAL BRANCH INST. AND     <====
                                                       ;           REPLACE THE MOVE INSTRUCTION     <====
                                                       ;           WHICH FOLLOWS W/ 707             <====
027620 012742 000663           MOV     #663,-(R2)      ;MOVE TO MAILBOX #  *******  663  *******
027624 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027626 000000                  HALT                    ;WRONG INCREMENT OF R4
027630 005006          BR6:    CLR     %6
027632 005004                  CLR     %4
027634 122426                  CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
027636 020627 000002           CMP     %6,#2
027642 001404                  BEQ     BR7
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                       ;           CONDITIONAL BRANCH INST. AND     <====
                                                       ;           REPLACE THE MOVE INSTRUCTION     <====
                                                       ;           WHICH FOLLOWS W/ 675             <====
027644 012742 000664           MOV     #664,-(R2)      ;MOVE TO MAILBOX #  *******  664  *******
027650 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027652 000000                  HALT                    ;WRONG INCREMENT OF R6

027654 005006          BR7:    CLR     %6
027656 005004                  CLR     %4
```

```
027660  122426                          CMPB    (4)+,(6)+           ;TEST INCREMENT OF R4
027662  020427  000001                  CMP     %4,#1
027666  001404                          BEQ     BR10
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 663             <====
027670  012742  000665                  MOV     #665,-(R2)          ;MOVE TO MAILBOX #  *******  665  *******
027674  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027676  000000                          HALT                        ;WRONG INCREMENT OF R4

027700  012706  001000          BR10:   MOV     #1000,%6
027704  124627  000000                  CMPB    -(6),#HERE          ;TEST DECREMENT OF R6
027710  022706  000776                  CMP     #776,%6
027714  001404                          BEQ     TS301
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 650             <====
027716  012742  000666                  MOV     #666,-(R2)          ;MOVE TO MAILBOX #  *******  666  *******
027722  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
027724  000000                          HALT                        ;WRONG DECREMENT OF R6,OR WRONG $TSTNM
                                                                    ;  OR SEQUENCE ERROR
                                ;*******************************************************************************************
                                ;TEST 301       TEST TRANSFER OF .BYTE USING R6
                                ;*******************************************************************************************
027726  005212                  TS301:  INC     (R2)                ;UPDATE TEST NUMBER
027730  022712  000301                  CMP     #301,(R2)           ;SEQUENCE ERROR?
027734  001133                          BNE     TS302-10            ;BR TO ERROR HALT ON SEQ ERROR
027736  012767  123456  177450          MOV     #123456,K5
027744  012767  050505  177432          MOV     #050505,K1
027752  012705  027404                  MOV     #K1,%5              ;%5=(050505)K1
027756  012706  027414                  MOV     #K5,%6              ;%6=(123456)K5
027762  112625                          MOVB    (6)+,(5)+           ;LOW .BYTE OF R6 TO R5
027764  022767  050456  177412          CMP     #050456,K1
027772  001404                          BEQ     BR11
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 760             <====
027774  012742  000667                  MOV     #667,-(R2)          ;MOVE TO MAILBOX #  *******  667  *******
030000  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
030002  000000                          HALT                        ;FALSE TRANSFER OF .BYTE

030004  012767  123456  177402  BR11:   MOV     #123456,K5
030012  012767  050505  177364          MOV     #050505,K1
030020  012705  027404                  MOV     #K1,%5              ;%5(050505)K1
030024  012706  027416                  MOV     #K6,%6              ;%6(123456)K5
030030  114625                          MOVB    -(6),(5)+           ;LOW .BYTE OF R6 TO R5 (DECREMENT)
030032  026727  177346  050456          CMP     K1,#050456
030040  001404                          BEQ     BR12
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 735             <====
030042  012742  000670                  MOV     #670,-(R2)          ;MOVE TO MAILBOX #  *******  670  *******
```

```
030046  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030050  000000                                  HALT                    ;FALSE R6 .BYTE TRANSFER

030052  012767  123456  177324  BR12:   MOV     #123456,K1
030060  012767  050505  177326          MOV     #050505,K5
030066  012705  027404                  MOV     #K1,%5          ;(123456)
030072  012706  027414                  MOV     #K5,%6          ;(050505)
030076  112526                          MOVB    (5)+,(6)+       ;LOW OF R5 TO LOW OF R6
030100  022767  050456  177306          CMP     #050456,K5
030106  001404                          BEQ     BR13
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 712            <====
030110  012742  000671                  MOV     #671,-(R2)      ;MOVE TO MAILBOX #  *******  671  *******
030114  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030116  000000                          HALT                    ;FALSE R6 .BYTE TRANSFER

030120  012767  123456  177256  BR13:   MOV     #123456,K1
030126  012767  050505  177260          MOV     #050505,K5
030134  012705  027405                  MOV     #K1+1,%5        ;123456
030140  012706  027414                  MOV     #K5,%6          ;050505
030144  112526                          MOVB    (5)+,(6)+       ;HIGH OF R5 TO LOW OF R6
030146  026727  177242  050647          CMP     K5,#050647
030154  001404                          BEQ     BR14
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 667            <====
030156  012742  000672                  MOV     #672,-(R2)      ;MOVE TO MAILBOX #  *******  672  *******
030162  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030164  000000                          HALT                    ;FALSE R6 .BYTE TRANSFER

030166  012767  123456  177210  BR14:   MOV     #123456,K1
030174  012767  050505  177212          MOV     #050505,K5
030202  012705  027405                  MOV     #K1+1,%5        ;R5-123456-ODD ADDRESS
030206  012706  027414                  MOV     #K5,%6          ;R6-050505--.EVEN ADDRESS
030212  112625                          MOVB    (6)+,(5)+       ;LOW OF R6 TO HIGH OF R5
030214  022767  042456  177162          CMP     #042456,K1
030222  001404                          BEQ     TS302
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 644            <====
030224  012742  000673                  MOV     #673,-(R2)      ;MOVE TO MAILBOX #  *******  673  *******
030230  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030232  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
                                ;*******************************************************************************
030234  005212                  TS302:  INC     (R2)            ;UPDATE TEST NUMBER
030236  022712  000302                  CMP     #302,(R2)       ;SEQUENCE ERROR?
030242  001074                          BNE     TS303-10        ;BR TO ERROR HALT ON SEQ ERROR
030244  126767  177150  177147          CMPB    K7,K7+1         ;SAME .WORD LOW TO HIGH
030252  001404                          BEQ     BR15
```

```
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 773            <====
030254  012742  000674                 MOV   #674,-(R2)   ;MOVE TO MAILBOX #  *******  674  *******
030260  005242                         INC   -(R2)        ;SET MSGTYP TO FATAL ERROR
030262  000000                         HALT               ;SHOULD COMPARE LOW TO HIGH

030264  126767  177131  177126  BR15:  CMPB  K7+1,K7      ;COMPARE ODD TO .EVEN SAME .WORD
030272  001404                         BEQ   BR16
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 763            <====
030274  012742  000675                 MOV   #675,-(R2)   ;MOVE TO MAILBOX #  *******  675  *******
030300  005242                         INC   -(R2)        ;SET MSGTYP TO FATAL ERROR
030302  000000                         HALT               ;ODD TO .EVEN .BYTE FAILURE

030304  126767  177113  177106  BR16:  CMPB  K10+1,K7     ;SEQUENTIAL .BYTES
030312  001404                         BEQ   BR17
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 753            <====
030314  012742  000676                 MOV   #676,-(R2)   ;MOVE TO MAILBOX #  *******  676  *******
030320  005242                         INC   -(R2)        ;SET MSGTYP TO FATAL ERROR
030322  000000                         HALT               ;ODD TO .EVEN FAILED

030324  126767  177072  177064  BR17:  CMPB  K10,K6
030332  001404                         BEQ   BR20
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 743            <====
030334  012742  000677                 MOV   #677,-(R2)   ;MOVE TO MAILBOX #  *******  677  *******
030340  005242                         INC   -(R2)        ;SET MSGTYP TO FATAL ERROR
030342  000000                         HALT               ;.EVEN TO EVEN FAILED
030344  126767  177051  177051  BR20:  CMPB  K7+1,K10+1
030352  001404                         BEQ   BR21
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 733            <====
030354  012742  000700                 MOV   #700,-(R2)   ;MOVE TO MAILBOX #  *******  700  *******
030360  005242                         INC   -(R2)        ;SET MSGTYP TO FATAL ERROR
030362  000000                         HALT               ;ODD TO ODD FAILED

030364  126767  177032  177031  BR21:  CMPB  K10,K10+1
030372  001004                         BNE   BR22
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 723            <====
030374  012742  000701                 MOV   #701,-(R2)   ;MOVE TO MAILBOX #  *******  701  *******
030400  005242                         INC   -(R2)        ;SET MSGTYP TO FATAL ERROR
030402  000000                         HALT               ;LOW TO HIGH IN SAME .WORD FAILED
```

```
030404 126767 177013 177011  BR22:  CMPB   K10+1,K10+1
030412 001404                       BEQ    BR23
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                       ;           CONDITIONAL BRANCH INST. AND    <====
                                                       ;           REPLACE THE MOVE INSTRUCTION    <====
                                                       ;           WHICH FOLLOWS W/ 713            <====
030414 012742 000702                MOV    #702,-(R2)  ;MOVE TO MAILBOX #  *******  702  *******
030420 005242                       INC    -(R2)       ;SET MSGTYP TO FATAL ERROR
030422 000000                       HALT               ;HIGH TO LOW IN SAME .WORD FAILED
030424 126767 176772 176767  BR23:  CMPB   K10,K7+1
030432 001004                       BNE    TS303
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                       ;           CONDITIONAL BRANCH INST. AND    <====
                                                       ;           REPLACE THE MOVE INSTRUCTION    <====
                                                       ;           WHICH FOLLOWS W/ 703            <====
030434 012742 000703                MOV    #703,-(R2)  ;MOVE TO MAILBOX #  *******  703  *******
030440 005242                       INC    -(R2)       ;SET MSGTYP TO FATAL ERROR
030442 000000                       HALT               ;.EVEN TO ODD FAILED,OR WRONG $TSTNM
                                                       ;  OR SEQUENCE ERROR

                             ;*****************************************************************************
                             ;TEST 303          TEST THE CC BITS
                             ;*****************************************************************************
030444 005212                TS303: INC    (R2)        ;UPDATE TEST NUMBER
030446 022712 000303                CMP    #303,(R2)   ;SEQUENCE ERROR?
030452 001053                       BNE    TS304-10    ;BR TO ERROR HALT ON SEQ ERROR
030454 000277                       SCC                ;SET STATUS
030456 005067 147314                CLR    STATUS      ;CLEAR STATUS
030462 103004                       BCC    BR33
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                       ;           CONDITIONAL BRANCH INST. AND    <====
                                                       ;           REPLACE THE MOVE INSTRUCTION    <====
                                                       ;           WHICH FOLLOWS W/ 773            <====
030464 012742 000704                MOV    #704,-(R2)  ;MOVE TO MAILBOX #  *******  704  *******
030470 005242                       INC    -(R2)       ;SET MSGTYP TO FATAL ERROR
030472 000000                       HALT               ;C NOT CLEAR
030474                       BR33:
030474 102004                       BVC    BR34
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                       ;           CONDITIONAL BRANCH INST. AND    <====
                                                       ;           REPLACE THE MOVE INSTRUCTION    <====
                                                       ;           WHICH FOLLOWS W/ 766            <====
030476 012742 000705                MOV    #705,-(R2)  ;MOVE TO MAILBOX #  *******  705  *******
030502 005242                       INC    -(R2)       ;SET MSGTYP TO FATAL ERROR
030504 000000                       HALT               ;V NOT CLEAR
030506                       BR34:
030506 001004                       BNE    BR35
                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                       ;           CONDITIONAL BRANCH INST. AND    <====
                                                       ;           REPLACE THE MOVE INSTRUCTION    <====
                                                       ;           WHICH FOLLOWS W/ 761            <====
030510 012742 000706                MOV    #706,-(R2)  ;MOVE TO MAILBOX #  *******  706  *******
030514 005242                       INC    -(R2)       ;SET MSGTYP TO FATAL ERROR
```

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030516  000000                          HALT                    ;Z NOT CLEAR
030520                          BR35:
030520  100004                          BPL     BR36
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 754             <====
030522  012742  000707                  MOV     #707,-(R2)      ;MOVE TO MAILBOX #  *******  707  *******
030526  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030530  000000                          HALT                    ;N NOT CLEAR
030532  000257                  BR36:   CCC                     ;CLEAR CONDITION CODES
030534  052767  000017  147234          BIS     #17,STATUS      ;SET STATUS TO ONES

030542  103404                          BCS     BR37
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 743             <====
030544  012742  000710                  MOV     #710,-(R2)      ;MOVE TO MAILBOX #  *******  710  *******
030550  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030552  000000                          HALT                    ;C NOT SET
030554                          BR37:
030554  102404                          BVS     BR40
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 736             <====
030556  012742  000711                  MOV     #711,-(R2)      ;MOVE TO MAILBOX #  *******  711  *******
030562  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030564  000000                          HALT                    ;V NOT SET
030566                          BR40:
030566  001404                          BEQ     BR41
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 731             <====
030570  012742  000712                  MOV     #712,-(R2)      ;MOVE TO MAILBOX #  *******  712  *******
030574  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030576  000000                          HALT                    ;Z NOT SET
030600                          BR41:
030600  100404                          BMI     TS304
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 724             <====
030602  012742  000713                  MOV     #713,-(R2)      ;MOVE TO MAILBOX #  *******  713  *******
030606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030610  000000                          HALT                    ;N NOT SET,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;**********************************************************************************
                                ;TEST 304       TEST THAT A TRAP OCCURS ON A RESERVED INSTRUCTION
                                ;**********************************************************************************
030612  005212                  TS304:  INC     (R2)            ;UPDATE TEST NUMBER
030614  022712  000304                  CMP     #304,(R2)       ;SEQUENCE ERROR?
030620  001006                          BNE     RETA            ;BR TO ERROR HALT ON SEQ ERROR
030622  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
```

```
030626  012767  030646  147154            MOV     #RETAH,RTRAP    ;RETURN LOCATION
030634  000077                            TRAPA                   ;RESERVED INSTRUCTION, SHOULD TRAP
030636                            RETA:
030636  012742  000714                    MOV     #714,-(R2)      ;MOVE TO MAILBOX #  *******  714  *******
030642  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030644  000000                            HALT                    ;RESERVE INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
030646                            RETAH:
                                  ;*************************************************************************
                                  ;TEST 305        TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                  ;*************************************************************************
030646  005212                    TS305:  INC     (R2)            ;UPDATE TEST NUMBER
030650  022712  000305                    CMP     #305,(R2)       ;SEQUENCE ERROR?
030654  001011                            BNE     TS306-10        ;BR TO ERROR HALT ON SEQ ERROR
030656  012706  001000                    MOV     #BUFF,SP        ;STACK POINTER SETUP
030662  012767  030672  147120            MOV     #RETB,RTRAP     ;RETURN POINTER
030670  000077                            TRAPA                   ;RESERVED INSTRUCTION
030672  020627  000774            RETB:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
030676  001404                            BEQ     TS306
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 766             <====
030700  012742  000715                    MOV     #715,-(R2)      ;MOVE TO MAILBOX #  *******  715  *******
030704  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030706  000000                            HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                  ;  OR SEQUENCE ERROR
                                  ;*************************************************************************
                                  ;TEST 306        TEST THAT PROPER P.C. IS SAVED
                                  ;*************************************************************************
030710  005212                    TS306:  INC     (R2)            ;UPDATE TEST NUMBER
030712  022712  000306                    CMP     #306,(R2)       ;SEQUENCE ERROR?
030716  001012                            BNE     TS307-10        ;BR TO ERROR HALT ON SEQ ERROR
030720  012706  001000                    MOV     #BUFF,SP        ;STACK POINTER SETUP
030724  012767  030734  147056            MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
030732  000077                    INSTC:  TRAPA                   ;TRAP ON THIS INSTRUCTION
030734  022767  030734  150032    RETC:   CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
030742  001404                            BEQ     TS307
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 765             <====
030744  012742  000716                    MOV     #716,-(R2)      ;MOVE TO MAILBOX #  *******  716  *******
030750  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030752  000000                            HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                  ;  OR SEQUENCE ERROR
                                  ;*************************************************************************
                                  ;TEST 307        TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                  ;*************************************************************************
030754  005212                    TS307:  INC     (R2)            ;UPDATE TEST NUMBER
030756  022712  000307                    CMP     #307,(R2)       ;SEQUENCE ERROR?
030762  001037                            BNE     TS310-10        ;BR TO ERROR HALT ON SEQ ERROR
030764  012706  001000                    MOV     #BUFF,SP        ;SET UP
030770  012767  031006  147012            MOV     #RETD,RTRAP     ;SET UP
030776  005067  146774                    CLR     CC              ;CLEAR CC AND PRIORITY
031002  000257                            CCC
031004  000077                            TRAPA                   ;TRAP
```

```
031006 026727 147764 000000 RETD:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
031014 001404                       BEQ     1$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 762             <====
031016 012742 000717                MOV     #717,-(R2)      ;MOVE TO MAILBOX #  *******  717  *******
031022 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031024 000000                       HALT                    ;INCORRECT STATUS
031026 012706 001000        1$:     MOV     #BUFF,SP        ;SET UP
031032 012767 031052 146750         MOV     #RETE,RTRAP     ;SET UP
031040 012767 000357 146730         MOV     #357,CC         ;SET PRIORITY
031046 000277                       SCC                     ;SET CC
031050 000077                       TRAPA                   ;TRAP
031052 026727 147720 000357 RETE:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
031060 001404                       BEQ     TS310
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 740             <====
031062 012742 000720                MOV     #720,-(R2)      ;MOVE TO MAILBOX #  *******  720  *******
031066 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031070 000000                       HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                            ;  OR SEQUENCE ERROR
                            ;*****************************************************************************
                            ;TEST 310       TEST THAT ''NEW'' STATUS IS CORRECT
                            ;*****************************************************************************
031072 005212               TS310:  INC     (R2)            ;UPDATE TEST NUMBER
031074 022712 000310                CMP     #310,(R2)       ;SEQUENCE ERROR?
031100 001110                       BNE     STPP            ;BR TO ERROR HALT ON SEQ ERROR
031102 012706 001000                MOV     #BUFF,SP
031106 012767 031122 146674         MOV     #RETF,RTRAP
031114 005067 146672                CLR     RTRAP+2         ;CLEAR FUTURE PRIORITY AND CC
031120 000077                       TRAPA
031122                      RETF:                           ;TEST FOR ''C'' CLEARED
031122 100004                       BPL     1$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 766             <====
031124 012742 000721                MOV     #721,-(R2)      ;MOVE TO MAILBOX #  *******  721  *******
031130 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031132 000000                       HALT                    ;N NOT CLEARED
031134                      1$:
031134 001004                       BNE     2$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 761             <====
031136 012742 000722                MOV     #722,-(R2)      ;MOVE TO MAILBOX #  *******  722  *******
031142 005242                       INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031144 000000                       HALT                    ;Z NOT CLEARED
031146                      2$:
031146 102004                       BVC     3$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
```

```
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 754             <====
031150  012742  000723                  MOV     #723,-(R2)      ;MOVE TO MAILBOX #  *******  723  *******
031154  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031156  000000                          HALT                    ;V NOT CLEARED
031160                          3$:
031160  103004                          BCC     4$
                                                                ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 747             <====
031162  012742  000724                  MOV     #724,-(R2)      ;MOVE TO MAILBOX #  *******  724  *******
031166  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031170  000000                          HALT                    ;C NOT CLEARED
031172  032767  000340  146576  4$:     BIT     #340,CC         ;TEST PRIORITY
031200  001404                          BEQ     5$
                                                                ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 737             <====
031202  012742  000725                  MOV     #725,-(R2)      ;MOVE TO MAILBOX #  *******  725  *******
031206  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031210  000000                          HALT                    ;PRIORITY NOT ZERO
031212  012706  001000          5$:     MOV     #BUFF,SP
031216  012767  031234  146564          MOV     #RETG,RTRAP
031224  012767  000357  146560          MOV     #357,RTRAP+2    ;SET NEW "CC" AND PRIORITY
031232  000077                          TRAPA                   ;TRAP HERE
031234                          RETG:
031234  100404                          BMI     1$
                                                                ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 721             <====
031236  012742  000726                  MOV     #726,-(R2)      ;MOVE TO MAILBOX #  *******  726  *******
031242  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031244  000000                          HALT                    ;N NOT SET
031246                          1$:
031246  001404                          BEQ     2$
                                                                ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 714             <====
031250  012742  000727                  MOV     #727,-(R2)      ;MOVE TO MAILBOX #  *******  727  *******
031254  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031256  000000                          HALT                    ;Z NOT SET
031260                          2$:
031260  102404                          BVS     3$
                                                                ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 707             <====
031262  012742  000730                  MOV     #730,-(R2)      ;MOVE TO MAILBOX #  *******  730  *******
031266  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031270  000000                          HALT                    ;V NOT SET
031272                          3$:
031272  103404                          BCS     4$
```

```
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 702            <====
031274  012742  000731                   MOV     #731,-(R2)     ;MOVE TO MAILBOX #  *******  731  *******
031300  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
031302  000000                           HALT                   ;C NOT SET
031304  016706  146466          4$:      MOV     CC,SP
031310  042706  000017                   BIC     #17,SP
031314  022706  000340                   CMP     #340,SP
031320  001404                           BEQ     STPPA
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 667            <====
031322                                  STPP:
031322  012742  000732                   MOV     #732,-(R2)     ;MOVE TO MAILBOX #  *******  732  *******
031326  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
031330  000000                           HALT                   ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
031332  012767  000012  146450  STPPA:   MOV     #12,10
031340  005067  146446                   CLR     12
                                ;*******************************************************************************
                                ;TEST 311        TEST THAT A TRAP OCCURS FOR A ''TRAP'' INSTRUCTION
                                ;*******************************************************************************
031344  005212                  TS311:   INC     (R2)           ;UPDATE TEST NUMBER
031346  022712  000311                   CMP     #311,(R2)      ;SEQUENCE ERROR?
031352  001013                           BNE     TS312-10       ;BR TO ERROR HALT ON SEQ ERROR
031354  012767  000012  146426           MOV     #12,10
031362  005067  146424                   CLR     12
031366  012706  001000                   MOV     #BUFF,SP       ;STACK POINTER SETUP
031372  012767  031412  146434           MOV     #RETA1,RTRAP1  ;RETURN LOCATION
031400  104400                           TRAP                   ;RESERVED INSTRUCTION, SHOULD TRAP
031402  012742  000733                   MOV     #733,-(R2)     ;MOVE TO MAILBOX #  *******  733  *******
031406  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
031410  000000                           HALT                   ;TRAP DIDN'T TRAP,OR WRONG $TSTNM
031412                          RETA1:
                                ;*******************************************************************************
                                ;TEST 312        TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************************
031412  005212                  TS312:   INC     (R2)           ;UPDATE TEST NUMBER
031414  022712  000312                   CMP     #312,(R2)      ;SEQUENCE ERROR?
031420  001011                           BNE     TS313-10       ;BR TO ERROR HALT ON SEQ ERROR
031422  012706  001000                   MOV     #BUFF,SP       ;STACK POINTER SETUP
031426  012767  031436  146400           MOV     #RETB1,RTRAP1  ;RETURN POINTER
031434  104400                           TRAP                   ;RESERVED INSTRUCTION
031436  020627  000774          RETB1:   CMP     SP,#BUFF-4     ;TEST DECREMENT OF SP
031442  001404                           BEQ     TS313
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
031444  012742  000734                   MOV     #734,-(R2)     ;MOVE TO MAILBOX #  *******  734  *******
031450  005242                           INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
031452  000000                           HALT                   ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
```

```
                                        ;TEST 313        TEST THAT PROPER P.C. IS SAVED
                                        ;*****************************************************************************
031454  005212                          TS313:  INC     (R2)                    ;UPDATE TEST NUMBER
031456  022712  000313                          CMP     #313,(R2)               ;SEQUENCE ERROR?
031462  001012                                  BNE     TS314-10                ;BR TO ERROR HALT ON SEQ ERROR
031464  012706  001000                          MOV     #BUFF,SP                ;STACK POINTER SETUP
031470  012767  031500  146336                  MOV     #RETC1,RTRAP1           ;RETURN FROM TRAP POINTER
031476  104400                                  TRAP                            ;TRAP ON THIS INSTRUCTION
031500  022767  031500  147266  RETC1:  CMP     #.,BUFF-4               ;CHECK INCREMENTED P.C.
031506  001404                                  BEQ     TS314
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;          CONDITIONAL BRANCH INST. AND     <====
                                                                        ;          REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;          WHICH FOLLOWS W/ 765             <====
031510  012742  000735                          MOV     #735,-(R2)              ;MOVE TO MAILBOX #  *******  735  *******
031514  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
031516  000000                                  HALT                            ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;*****************************************************************************
                                        ;TEST 314        TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                        ;*****************************************************************************
031520  005212                          TS314:  INC     (R2)                    ;UPDATE TEST NUMBER
031522  022712  000314                          CMP     #314,(R2)               ;SEQUENCE ERROR?
031526  001036                                  BNE     TS315-10                ;BR TO ERROR HALT ON SEQ ERROR
031530  012706  001000                          MOV     #BUFF,SP                ;SET UP
031534  012767  031552  146272                  MOV     #RETD1,RTRAP1           ;SET UP
031542  005067  146230                          CLR     CC                      ;CLEAR CC AND PRIORITY
031546  000257                                  CCC
031550  104400                                  TRAP                            ;TRAP
031552  026727  147220  000000  RETD1:  CMP     BUFF-2,#0               ;TEST THAT OLD STATUS WENT TO STACK
031560  001404                                  BEQ     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;          CONDITIONAL BRANCH INST. AND     <====
                                                                        ;          REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;          WHICH FOLLOWS W/ 762             <====
031562  012742  000736                          MOV     #736,-(R2)              ;MOVE TO MAILBOX #  *******  736  *******
031566  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
031570  000000                                  HALT                            ;INCORRECT STATUS
031572  012706  001000          1$:     MOV     #BUFF,SP                ;SET UP
031576  012767  031614  146230                  MOV     #RETE1,RTRAP1           ;SET UP
031604  012767  000357  146164                  MOV     #357,CC                 ;SET PRIORITY
031612  104400                                  TRAP                            ;SET CC
031614  026727  147156  000357  RETE1:  CMP     BUFF-2,#357             ;COMPARES STATUS ON STACK
031622  001404                                  BEQ     TS315
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;          CONDITIONAL BRANCH INST. AND     <====
                                                                        ;          REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;          WHICH FOLLOWS W/ 741             <====
031624  012742  000737                          MOV     #737,-(R2)              ;MOVE TO MAILBOX #  *******  737  *******
031630  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
031632  000000                                  HALT                            ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;*****************************************************************************
                                        ;TEST 315        TEST THAT ''NEW'' STATUS IS CORRECT
                                        ;*****************************************************************************
031634  005212                          TS315:  INC     (R2)                    ;UPDATE TEST NUMBER
```

```
031636  022712  000315                  CMP     #315,(R2)       ;SEQUENCE ERROR?
031642  001110                          BNE     TS316-10        ;BR TO ERROR HALT ON SEQ ERROR
031644  012706  001000                  MOV     #BUFF,SP
031650  012767  031664  146156          MOV     #RETF1,RTRAP1
031656  005067  146154                  CLR     RTRAP1+2        ;CLEAR FUTURE PRIORITY AND CC
031662  104400                          TRAP
031664                          RETF1:                          ;TEST FOR ''C'' CLEARED
031664  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
031666  012742  000740                  MOV     #740,-(R2)      ;MOVE TO MAILBOX #  *******  740  *******
031672  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031674  000000                          HALT                    ;C NOT CLEARED
031676                          1$:
031676  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 761            <====
031700  012742  000741                  MOV     #741,-(R2)      ;MOVE TO MAILBOX #  *******  741  *******
031704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031706  000000                          HALT                    ;Z NOT CLEARED
031710                          2$:
031710  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 754            <====
031712  012742  000742                  MOV     #742,-(R2)      ;MOVE TO MAILBOX #  *******  742  *******
031716  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031720  000000                          HALT                    ;V NOT CLEARED
031722                          3$:
031722  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 747            <====
031724  012742  000743                  MOV     #743,-(R2)      ;MOVE TO MAILBOX #  *******  743  *******
031730  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031732  000000                          HALT                    ;C NOT CLEARED
031734  032767  000340  146034  4$:     BIT     #340,CC         ;TEST PRIORITY
031742  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 737            <====
031744  012742  000744                  MOV     #744,-(R2)      ;MOVE TO MAILBOX #  *******  744  *******
031750  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031752  000000                          HALT                    ;PRIORITY NOT ZERO
031754  012706  001000          5$:     MOV     #BUFF,SP
031760  012767  031776  146046          MOV     #RETG1,RTRAP1
031766  012767  000357  146042          MOV     #357,RTRAP1+2   ;SET NEW ''CC'' AND PRIORITY
031774  104400                          TRAP                    ;TRAP HERE
031776                          RETG1:
```

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031776  100404                  BMI     1$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 721            <====
032000  012742  000745          MOV     #745,-(R2)      ;MOVE TO MAILBOX #  *******  745  *******
032004  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032006  000000                  HALT                    ;N NOT SET
032010                  1$:
032010  001404                  BEQ     2$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 714            <====
032012  012742  000746          MOV     #746,-(R2)      ;MOVE TO MAILBOX #  *******  746  *******
032016  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032020  000000                  HALT                    ;Z NOT SET
032022                  2$:
032022  102404                  BVS     3$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 707            <====
032024  012742  000747          MOV     #747,-(R2)      ;MOVE TO MAILBOX #  *******  747  *******
032030  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032032  000000                  HALT                    ;V NOT SET
032034                  3$:
032034  103404                  BCS     4$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 702            <====
032036  012742  000750          MOV     #750,-(R2)      ;MOVE TO MAILBOX #  *******  750  *******
032042  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032044  000000                  HALT                    ;C NOT SET
032046  016706  145724  4$:     MOV     CC,SP
032052  042706  000017          BIC     #17,SP
032056  022706  000340          CMP     #340,SP
032062  001404                  BEQ     TS316
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 667            <====
032064  012742  000751          MOV     #751,-(R2)      ;MOVE TO MAILBOX #  *******  751  *******
032070  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032072  000000                  HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                        ;  OR SEQUENCE ERROR
                        ;*******************************************************************************
                        ;TEST 316       TEST THAT ALL COMBINATION OF ''TRAP'' WILL CAUSE A TRAP
                        ;*******************************************************************************
032074  005212          TS316:  INC     (R2)            ;UPDATE TEST NUMBER
032076  022712  000316          CMP     #316,(R2)       ;SEQUENCE ERROR?
032102  001011                  BNE     BR45            ;BR TO ERROR HALT ON SEQ ERROR
                                                        ;***** F11 **** ADD +376 TO SHORTEN TEST
032104  012767  104776  000012  MOV     #TRAP+376,RB1   ;INITIALIZE BASE TRAP INSTRUCTION
032112  012767  032136  145714  MOV     #RA1,34         ;RETURN FROM TRAP TO RA1
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032120  012706  001000           RC1:    MOV     #BUFF,SP          ;SET UP STACK POINTER
032124  104400                   RB1:    TRAP                      ;TRAP INST WILL BE MODIFIED TO TRAP+377
032126                           BR45:
032126  012742  000752                   MOV     #752,-(R2)        ;MOVE TO MAILBOX #  *******  752  *******
032132  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
032134  000000                           HALT                      ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
032136  005267  177762           RA1:    INC     RB1               ;INCREMENT TRAP INSTRUCTION
032142  022767  104777  177754           CMP     #104777,RB1       ;TRAP+377 TO UPPER LIMIT
032150  103363                           BHIS    RC1               ;HAVE WE TESTED ALL
032152  012767  000036  145654           MOV     #36,34
032160  005067  145652                   CLR     36

                                 ;*************************************************************************
                                 ;TEST 317        TEST THAT A TRAP OCCURES ON AN ''IOT'' INSTRUCTION
                                 ;*************************************************************************
032164  005212                   TS317:  INC     (R2)              ;UPDATE TEST NUMBER
032166  022712  000317                   CMP     #317,(R2)         ;SEQUENCE ERROR?
032172  001006                           BNE     TS320-10          ;BR TO ERROR HALT ON SEQ ERROR
032174  012706  001000                   MOV     #BUFF,SP          ;STACK POINTER SETUP
032200  012767  032220  145612           MOV     #RETA2,RTRAP2     ;RETURN LOCATION
032206  000004                           IOT                       ;RESERVE INSTRUCTION, SHOULD TRAP
032210  012742  000753                   MOV     #753,-(R2)        ;MOVE TO MAILBOX #  *******  753  *******
032214  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
032216  000000                           HALT                      ;IOT DIDN'T TRAP,OR WRONG $TSTNM
032220                           RETA2:

                                 ;*************************************************************************
                                 ;TEST 320        TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                 ;*************************************************************************
032220  005212                   TS320:  INC     (R2)              ;UPDATE TEST NUMBER
032222  022712  000320                   CMP     #320,(R2)         ;SEQUENCE ERROR?
032226  001011                           BNE     TS321-10          ;BR TO ERROR HALT ON SEQ ERROR
032230  012706  001000                   MOV     #BUFF,SP          ;STACK POINTER SETUP
032234  012767  032244  145556           MOV     #RETB2,RTRAP2     ;RETURN POINTER
032242  000004                           IOT                       ;RESERVED INSTRUCTION
032244  020627  000774           RETB2:  CMP     SP,#BUFF-4        ;TEST DECREMENT OF SP
032250  001404                           BEQ     TS321
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 766            <====
032252  012742  000754                   MOV     #754,-(R2)        ;MOVE TO MAILBOX #  *******  754  *******
032256  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
032260  000000                           HALT                      ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                   ;  OR SEQUENCE ERROR

                                 ;*************************************************************************
                                 ;TEST 321        TEST THAT PROPER P.C. IS SAVED
                                 ;*************************************************************************
032262  005212                   TS321:  INC     (R2)              ;UPDATE TEST NUMBER
032264  022712  000321                   CMP     #321,(R2)         ;SEQUENCE ERROR?
032270  001012                           BNE     TS322-10          ;BR TO ERROR HALT ON SEQ ERROR
032272  012706  001000                   MOV     #BUFF,SP          ;STACK POINTER SETUP
032276  012767  032306  145514           MOV     #RETC2,RTRAP2     ;RETURN FROM TRAP POINTER
032304  000004                           IOT                       ;TRAP ON THIS INSTRUCTION
032306  022767  032306  146460   RETC2:  CMP     #.,BUFF-4         ;CHECK FOR INCREMENTED P.C.
032314  001404                           BEQ     TS322
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
```

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                                                                   ;                REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;                WHICH FOLLOWS W/ 765            <====
032316  012742  000755                   MOV     #755,-(R2)        ;MOVE TO MAILBOX #  *******  755  *******
032322  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
032324  000000                           HALT                      ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                   ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************
                                 ;TEST 322          TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                 ;*******************************************************************************
032326  005212                   TS322:  INC     (R2)              ;UPDATE TEST NUMBER
032330  022712  000322                   CMP     #322,(R2)         ;SEQUENCE ERROR?
032334  001037                           BNE     TS323-10          ;BR TO ERROR HALT ON SEQ ERROR
032336  012706  001000                   MOV     #BUFF,SP          ;SET UP
032342  012767  032360  145450           MOV     #RETD2,RTRAP2     ;SET UP
032350  005067  145422                   CLR     CC                ;CLEAR CC AND PRIORITY
032354  000257                           CCC
032356  000004                           IOT                       ;TRAP
032360  026727  146412  000000   RETD2:  CMP     BUFF-2,#0         ;TEST THAT OLD STATUS WENT TO STACK
032366  001404                           BEQ     1$
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 762             <====
032370  012742  000756                   MOV     #756,-(R2)        ;MOVE TO MAILBOX #  *******  756  *******
032374  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
032376  000000                           HALT                      ;INCORRECT STATUS
032400  012706  001000           1$:     MOV     #BUFF,SP          ;SET UP
032404  012767  032424  145406           MOV     #RETE2,RTRAP2     ;SET UP
032412  012767  000357  145356           MOV     #357,CC           ;SET PRIORITY
032420  000277                           SCC                       ;SET CC
032422  000004                           IOT                       ;TRAP
032424  026727  146346  000357   RETE2:  CMP     BUFF-2,#357       ;COMPARES STATUS ON STACK
032432  001404                           BEQ     TS323
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 740             <====
032434  012742  000757                   MOV     #757,-(R2)        ;MOVE TO MAILBOX #  *******  757  *******
032440  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
032442  000000                           HALT                      ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                   ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************
                                 ;TEST 323          TEST THAT ''NEW'' STATUS IS CORRECT
                                 ;*******************************************************************************
032444  005212                   TS323:  INC     (R2)              ;UPDATE TEST NUMBER
032446  022712  000323                   CMP     #323,(R2)         ;SEQUENCE ERROR?
032452  001110                           BNE     BR46              ;BR TO ERROR HALT ON SEQ ERROR
032454  012706  001000                   MOV     #BUFF,SP
032460  012767  032474  145332           MOV     #RETF2,RTRAP2
032466  005067  145330                   CLR     RTRAP2+2          ;CLEAR FUTURE PRIORITY AND CC
032472  000004                           IOT
032474                           RETF2:                            ;TEST FOR ''C'' CLEARED
032474  100004                           BPL     1$
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
```

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                                                                  ;                WHICH FOLLOWS W/ 766          <====
032476  012742  000760                     MOV     #760,-(R2)     ;MOVE TO MAILBOX #  *******  760  *******
032502  005242                             INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
032504  000000                             HALT                   ;N NOT CLEARED
032506                             1$:
032506  001004                             BNE     2$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                  ;                CONDITIONAL BRANCH INST. AND  <====
                                                                  ;                REPLACE THE MOVE INSTRUCTION  <====
                                                                  ;                WHICH FOLLOWS W/ 761          <====
032510  012742  000761                     MOV     #761,-(R2)     ;MOVE TO MAILBOX #  *******  761  *******
032514  005242                             INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
032516  000000                             HALT                   ;Z NOT CLEARED
032520                             2$:
032520  102004                             BVC     3$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                  ;                CONDITIONAL BRANCH INST. AND  <====
                                                                  ;                REPLACE THE MOVE INSTRUCTION  <====
                                                                  ;                WHICH FOLLOWS W/ 754          <====
032522  012742  000762                     MOV     #762,-(R2)     ;MOVE TO MAILBOX #  *******  762  *******
032526  005242                             INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
032530  000000                             HALT                   ;V NOT CLEARED
032532                             3$:
032532  103004                             BCC     4$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                  ;                CONDITIONAL BRANCH INST. AND  <====
                                                                  ;                REPLACE THE MOVE INSTRUCTION  <====
                                                                  ;                WHICH FOLLOWS W/ 747          <====
032534  012742  000763                     MOV     #763,-(R2)     ;MOVE TO MAILBOX #  *******  763  *******
032540  005242                             INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
032542  000000                             HALT                   ;C NOT CLEARED
032544  032767  000340  145224     4$:     BIT     #340,CC        ;TEST PRIORITY
032552  001404                             BEQ     5$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                  ;                CONDITIONAL BRANCH INST. AND  <====
                                                                  ;                REPLACE THE MOVE INSTRUCTION  <====
                                                                  ;                WHICH FOLLOWS W/ 737          <====
032554  012742  000764                     MOV     #764,-(R2)     ;MOVE TO MAILBOX #  *******  764  *******
032560  005242                             INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
032562  000000                             HALT                   ;PRIORITY NOT ZERO
032564  012706  001000             5$:     MOV     #BUFF,SP
032570  012767  032606  145222             MOV     #RETG2,RTRAP2
032576  012767  000357  145216             MOV     #357,RTRAP2+2  ;SET NEW ''CC'' AND PRIORITY
032604  000004                             IOT                    ;TRAP HERE
032606                             RETG2:
032606  100404                             BMI     1$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                  ;                CONDITIONAL BRANCH INST. AND  <====
                                                                  ;                REPLACE THE MOVE INSTRUCTION  <====
                                                                  ;                WHICH FOLLOWS W/ 721          <====
032610  012742  000765                     MOV     #765,-(R2)     ;MOVE TO MAILBOX #  *******  765  *******
032614  005242                             INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
032616  000000                             HALT                   ;N NOT SET
032620                             1$:
032620  001404                             BEQ     2$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
```

```
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 714            <====
032622  012742  000766                  MOV     #766,-(R2)      ;MOVE TO MAILBOX #  *******  766  *******
032626  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032630  000000                          HALT                    ;Z NOT SET
032632                          2$:
032632  102404                          BVS     3$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 707            <====
032634  012742  000767                  MOV     #767,-(R2)      ;MOVE TO MAILBOX #  *******  767  *******
032640  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032642  000000                          HALT                    ;V NOT SET
032644                          3$:
032644  103404                          BCS     4$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 702            <====
032646  012742  000770                  MOV     #770,-(R2)      ;MOVE TO MAILBOX #  *******  770  *******
032652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032654  000000                          HALT                    ;C NOT SET
032656  016706  145114          4$:     MOV     CC,SP
032662  042706  000017                  BIC     #17,SP
032666  022706  000340                  CMP     #340,SP
032672  001404                          BEQ     BR46A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 667            <====
032674                          BR46:
032674  012742  000771                  MOV     #771,-(R2)      ;MOVE TO MAILBOX #  *******  771  *******
032700  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032702  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
032704  012767  000022  145106  BR46A:  MOV     #22,20          ;.+2
032712  005067  145104                  CLR     22              ;HALT
                                ;*****************************************************************************
                                ;TEST 324       TEST THAT A TRAP OCCURS ON AN EMT  INSTRUCTION
                                ;*****************************************************************************
032716  005212                  TS324:  INC     (R2)            ;UPDATE TEST NUMBER
032720  022712  000324                  CMP     #324,(R2)       ;SEQUENCE ERROR?
032724  001006                          BNE     TS325-10        ;BR TO ERROR HALT ON SEQ ERROR
032726  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
032732  012767  032752  145070          MOV     #RETA3,RTRAP3   ;RETURN LOCATION
032740  104000                          EMT                     ;RESERVE INSTRUCTIOM, SHOULD TRAP
032742  012742  000772                  MOV     #772,-(R2)      ;MOVE TO MAILBOX #  *******  772  *******
032746  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032750  000000                          HALT                    ;EMT DIDN'T TRAP,OR WRONG $TSTNM
032752                          RETA3:
                                ;*****************************************************************************
                                ;TEST 325       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************
032752  005212                  TS325:  INC     (R2)            ;UPDATE TEST NUMBER
032754  022712  000325                  CMP     #325,(R2)       ;SEQUENCE ERROR?
```

```
032760  001011                          BNE     TS326-10        ;BR TO ERROR HALT ON SEQ ERROR
032762  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
032766  012767  032776  145034          MOV     #RETB3,RTRAP3   ;RETURN POINTER
032774  104000                          EMT                     ;RESERVED INSTRUCTION
032776  020627  000774          RETB3:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
033002  001404                          BEQ     TS326
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
033004  012742  000773                  MOV     #773,-(R2)      ;MOVE TO MAILBOX #  *******  773  *******
033010  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033012  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 326       TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************************
033014  005212                  TS326:  INC     (R2)            ;UPDATE TEST NUMBER
033016  022712  000326                  CMP     #326,(R2)       ;SEQUENCE ERROR?
033022  001012                          BNE     TS327-10        ;BR TO ERROR HALT ON SEQ ERROR
033024  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033030  012767  033040  144772          MOV     #RETC3,RTRAP3   ;RTURN FROM TRAP POINTER
033036  104000                          EMT                     ;TRAP ON THIS INSTRICTION
033040  022767  033040  145726  RETC3:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
033046  001404                          BEQ     TS327
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 765            <====
033050  012742  000774                  MOV     #774,-(R2)      ;MOVE TO MAILBOX #  *******  774  *******
033054  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033056  000000                          HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 327       TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
033060  005212                  TS327:  INC     (R2)            ;UPDATE TEST NUMBER
033062  022712  000327                  CMP     #327,(R2)       ;SEQUENCE ERROR?
033066  001037                          BNE     TS330-10        ;BR TO ERROR HALT ON SEQ ERROR
033070  012706  001000                  MOV     #BUFF,SP        ;SET UP
033074  012767  033112  144726          MOV     #RETD3,RTRAP3   ;SET UP
033102  005067  144670                  CLR     CC              ;CLEAR CC AND PRIORITY
033106  000257                          CCC
033110  104000                          EMT                     ;TRAP
033112  026727  145660  000000  RETD3:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
033120  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 762            <====
033122  012742  000775                  MOV     #775,-(R2)      ;MOVE TO MAILBOX #  *******  775  *******
033126  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033130  000000                          HALT                    ;INCORRECT STATUS
033132  012706  001000          1$:     MOV     #BUFF,SP        ;SET UP
033136  012767  033156  144664          MOV     #RETE3,RTRAP3   ;SET UP
033144  012767  000357  144624          MOV     #357,CC         ;SET PRIORITY
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033152  000277                          SCC                     ;SET CC
033154  104000                          EMT                     ;TRAP
033156  026727  145614  000357  RETE3:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
033164  001404                          BEQ     TS330
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 740            <====
033166  012742  000776                  MOV     #776,-(R2)      ;MOVE TO MAILBOX #  *******  776  *******
033172  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033174  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 330       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
033176  005212                  TS330:  INC     (R2)            ;UPDATE TEST NUMBER
033200  022712  000330                  CMP     #330,(R2)       ;SEQUENCE ERROR?
033204  001106                          BNE     TS331-10        ;BR TO ERROR HALT ON SEQ ERROR
033206  012706  001000                  MOV     #BUFF,SP
033212  012767  033226  144610          MOV     #RETF3,RTRAP3
033220  005067  144606                  CLR     RTRAP3+2        ;CLEAR FUTURE PRIORITY AND CC
033224  104000                          EMT
033226                          RETF3:                          ;TEST FOR "C" CLEARED
033226  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
033230  012742  000777                  MOV     #777,-(R2)      ;MOVE TO MAILBOX #  *******  777  *******
033234  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033236  000000                          HALT                    ;C NOT CLEARED
033240                          1$:
033240  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 761            <====
033242  012742  001000                  MOV     #1000,-(R2)     ;MOVE TO MAILBOX #  *******  1000  *******
033246  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033250  000000                          HALT                    ;Z NOT CLEARED
033252                          2$:
033252  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 754            <====
033254  012742  001001                  MOV     #1001,-(R2)     ;MOVE TO MAILBOX #  *******  1001  *******
033260  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033262  000000                          HALT                    ;V NOT CLEARED
033264                          3$:
033264  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 747            <====
033266  012742  001002                  MOV     #1002,-(R2)     ;MOVE TO MAILBOX #  *******  1002  *******
```

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033272  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033274  000000                          HALT                    ;C NOT CLEARED
033276  032767  000340  144472  4$:     BIT     #340,CC         ;TEST PRIORITY
033304  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 737           <====
033306  012742  001003                  MOV     #1003,-(R2)     ;MOVE TO MAILBOX #  *******  1003  *******
033312  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033314  000000                          HALT                    ;PRIORITY NOT ZERO
033316  012706  001000          5$:     MOV     #BUFF,SP
033322  012767  033340  144500          MOV     #RETG3,RTRAP3
033330  012767  000357  144474          MOV     #357,RTRAP3+2   ;SET NEW "CC" AND PRIORITY
033336  104000                          EMT                     ;TRAP HERE
033340                          RETG3:
033340  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 721           <====
033342  012742  001004                  MOV     #1004,-(R2)     ;MOVE TO MAILBOX #  *******  1004  *******
033346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033350  000000                          HALT                    ;N NOT SET
033352                          1$:
033352  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 714           <====
033354  012742  001005                  MOV     #1005,-(R2)     ;MOVE TO MAILBOX #  *******  1005  *******
033360  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033362  000000                          HALT                    ;Z NOT SET
033364                          2$:
033364  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 707           <====
033366  012742  001006                  MOV     #1006,-(R2)     ;MOVE TO MAILBOX #  *******  1006  *******
033372  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033374  000000                          HALT                    ;V NOT SET
033376                          3$:
033376  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 702           <====
033400  012742  001007                  MOV     #1007,-(R2)     ;MOVE TO MAILBOX #  *******  1007  *******
033404  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033406  000000                          HALT                    ;C NOT SET
033410  000257                  4$:     CCC
033412  022767  000340  144356          CMP     #340,CC
033420  001404                          BEQ     TS331
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
```

```
                                                                        ;                 REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;                 WHICH FOLLOWS W/ 671           <====
033422  012742  001010                      MOV     #1010,-(R2)         ;MOVE TO MAILBOX #  *******  1010  *******
033426  005242                              INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033430  000000                              HALT                        ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                    ;*******************************************************************************
                                    ;TEST 331          TEST THAT ALL COMBINATION OF EMT WILL CAUSE A TRAP
                                    ;*******************************************************************************
033432  005212                      TS331:  INC     (R2)                ;UPDATE TEST NUMBER
033434  022712  000331                      CMP     #331,(R2)           ;SEQUENCE ERROR?
033440  001011                              BNE     BR47                ;BR TO ERROR HALT ON SEQ ERROR
                                                                        ;**** F11 **** ADD +376 TO SHORTEN TEST
033442  012767  104376  000012              MOV     #EMT+376,RB                  ;INITIALIZE BASE EMT INSTRUCTION
033450  012767  033474  144352              MOV     #RA,30              ;RETURN FROM TRAP TO RA
033456  012706  001000              RC:     MOV     #BUFF,SP            ;SET UP STACK POINTER
033462  104000                      RB:     EMT                         ;TRAP INST. WILL BE MODIFIED TO EMT+377
033464                              BR47:
033464  012742  001011                      MOV     #1011,-(R2)         ;MOVE TO MAILBOX #  *******  1011  *******
033470  005242                              INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033472  000000                              HALT                        ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
033474  005267  177762              RA:     INC     RB                  ;INCREMENT TRAP INSTRUCTION
033500  022767  104377  177754              CMP     #104377,RB          ;EMT+377 TO EMT?
033506  103363                              BHIS    RC                  ;HAVE WE TESTED ALL
                                                                        ;YES
033510  012767  000032  144312              MOV     #32,30              ;/.+
033516  005067  144310                      CLR     32                  ;HALT
                                    ;*******************************************************************************
                                    ;TEST 332          TEST THAT A TRAP OCCURES ON AN ''TRACE-TRT'' INSTRUCTION
                                    ;*******************************************************************************
033522  005212                      TS332:  INC     (R2)                ;UPDATE TEST NUMBER
033524  022712  000332                      CMP     #332,(R2)           ;SEQUENCE ERROR?
033530  001006                              BNE     TS333-10            ;BR TO ERROR HALT ON SEQ ERROR
033532  012706  001000                      MOV     #BUFF,SP            ;STACK POINTER SETUP
033536  012767  033556  144250              MOV     #RETA4,RTRAP4       ;RETURN LOCATION
033544  000003                              TRT                         ;RESERVED INSTRUCTION, SHOULD TRAP
033546  012742  001012                      MOV     #1012,-(R2)         ;MOVE TO MAILBOX #  *******  1012  *******
033552  005242                              INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033554  000000                              HALT                        ;TRT DIDN'T TRAP,OR WRONG $TSTNM
033556                              RETA4:
                                    ;*******************************************************************************
                                    ;TEST 333          TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                    ;*******************************************************************************
033556  005212                      TS333:  INC     (R2)                ;UPDATE TEST NUMBER
033560  022712  000333                      CMP     #333,(R2)           ;SEQUENCE ERROR?
033564  001011                              BNE     TS334-10            ;BR TO ERROR HALT ON SEQ ERROR
033566  012706  001000                      MOV     #BUFF,SP            ;STACK POINTER SETUP
033572  012767  033602  144214              MOV     #RETB4,RTRAP4       ;RETURN POINTER
033600  000003                              TRT                         ;RESERVED INSTRUCTION
033602  020627  000774              RETB4:  CMP     SP,#BUFF-4          ;TEST DECREMENT OF SP
033606  001404                              BEQ     TS334
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 766             <====
033610  012742  001013                      MOV     #1013,-(R2)         ;MOVE TO MAILBOX #  *******  1013  *******
```

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033614  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033616  000000                                  HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;***********************************************************************
                                        ;TEST 334       TEST THAT PROPER P.C. IS SAVED
                                        ;***********************************************************************
033620  005212                          TS334:  INC     (R2)            ;UPDATE TEST NUMBER
033622  022712  000334                          CMP     #334,(R2)       ;SEQUENCE ERROR?
033626  001012                                  BNE     TS335-10        ;BR TO ERROR HALT ON SEQ ERROR
033630  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
033634  012767  033644  144152                  MOV     #RETC4,RTRAP4   ;RETURN FROM TRAP POINTER
033642  000003                                  TRT                     ;TRAP ON THIS INSTRUCTION
033644  022767  033644  145122  RETC4:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
033652  001404                                  BEQ     TS335
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 765            <====
033654  012742  001014                          MOV     #1014,-(R2)     ;MOVE TO MAILBOX #  *******  1014  *******
033660  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033662  000000                                  HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;***********************************************************************
                                        ;TEST 335       TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                        ;***********************************************************************
033664  005212                          TS335:  INC     (R2)            ;UPDATE TEST NUMBER
033666  022712  000335                          CMP     #335,(R2)       ;SEQUENCE ERROR?
033672  001037                                  BNE     TS336-10        ;BR TO ERROR HALT ON SEQ ERROR
033674  012706  001000                          MOV     #BUFF,SP        ;SET UP
033700  012767  033716  144106                  MOV     #RETD4,RTRAP4   ;SET UP
033706  005067  144064                          CLR     CC              ;CLEAR CC AND PRIORITY
033712  000257                                  CCC
033714  000003                                  TRT                     ;TRAP
033716  026727  145054  000000  RETD4:  CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
                                                                        ;TEST FOR ALL ZEROS
033724  001404                                  BEQ     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 762            <====
033726  012742  001015                          MOV     #1015,-(R2)     ;MOVE TO MAILBOX #  *******  1015  *******
033732  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033734  000000                                  HALT                    ;INCORRECT STATUS
033736  012706  001000                  1$:     MOV     #BUFF,SP        ;SET UP
033742  012767  033762  144044                  MOV     #RETE4,RTRAP4   ;SET UP
033750  012767  000357  144020                  MOV     #357,CC         ;SET PRIORITY
033756  000277                                  SCC                     ;SET-SET CC
033760  000003                                  TRT                     ;TRAP
033762  026727  145010  000357  RETE4:  CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
033770  001404                                  BEQ     TS336
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 740            <====
033772  012742  001016                          MOV     #1016,-(R2)     ;MOVE TO MAILBOX #  *******  1016  *******
033776  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
034000  000000                           HALT                              ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                           ;   OR SEQUENCE ERROR
                                 ;***********************************************************************************
                                 ;TEST 336           TEST THAT ''NEW'' STATUS IS CORRECT
                                 ;***********************************************************************************
034002  005212                   TS336:  INC        (R2)                   ;UPDATE TEST NUMBER
034004  022712  000336                   CMP        #336,(R2)              ;SEQUENCE ERROR?
034010  001110                           BNE        BR51                   ;BR TO ERROR HALT ON SEQ ERROR
034012  012706  001000                   MOV        #BUFF,SP
034016  012767  034032  143770           MOV        #RETF4,RTRAP4
034024  005067  143766                   CLR        RTRAP4+2               ;CLEAR FUTURE PRIORITY AND CC
034030  000003                           TRT
034032                           RETF4:                                    ;TEST FOR ''C'' CLEARED
034032  100004                           BPL        1$
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                           ;           CONDITIONAL BRANCH INST. AND      <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                           ;           WHICH FOLLOWS W/ 766              <====
034034  012742  001017                   MOV        #1017,-(R2)            ;MOVE TO MAILBOX #  *******  1017  *******
034040  005242                           INC        -(R2)                  ;SET MSGTYP TO FATAL ERROR
034042  000000                           HALT                              ;C NOT CLEARED
034044                           1$:
034044  001004                           BNE        2$
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                           ;           CONDITIONAL BRANCH INST. AND      <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                           ;           WHICH FOLLOWS W/ 761              <====
034046  012742  001020                   MOV        #1020,-(R2)            ;MOVE TO MAILBOX #  *******  1020  *******
034052  005242                           INC        -(R2)                  ;SET MSGTYP TO FATAL ERROR
034054  000000                           HALT                              ;Z NOT CLEARED
034056                           2$:
034056  102004                           BVC        3$
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                           ;           CONDITIONAL BRANCH INST. AND      <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                           ;           WHICH FOLLOWS W/ 754              <====
034060  012742  001021                   MOV        #1021,-(R2)            ;MOVE TO MAILBOX #  *******  1021  *******
034064  005242                           INC        -(R2)                  ;SET MSGTYP TO FATAL ERROR
034066  000000                           HALT                              ;V NOT CLEARED
034070                           3$:
034070  103004                           BCC        4$
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                           ;           CONDITIONAL BRANCH INST. AND      <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                           ;           WHICH FOLLOWS W/ 747              <====
034072  012742  001022                   MOV        #1022,-(R2)            ;MOVE TO MAILBOX #  *******  1022  *******
034076  005242                           INC        -(R2)                  ;SET MSGTYP TO FATAL ERROR
034100  000000                           HALT                              ;C NOT CLEARED
034102  032767  000340  143666   4$:     BIT        #340,CC                ;TEST PRIORITY
034110  001404                           BEQ        5$
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                           ;           CONDITIONAL BRANCH INST. AND      <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                           ;           WHICH FOLLOWS W/ 737              <====
034112  012742  001023                   MOV        #1023,-(R2)            ;MOVE TO MAILBOX #  *******  1023  *******
034116  005242                           INC        -(R2)                  ;SET MSGTYP TO FATAL ERROR
```

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034120  000000                          HALT                            ;PRIORITY NOT ZERO
034122  012706  001000          5$:     MOV     #BUFF,SP
034126  012767  034144  143660          MOV     #RETG4,RTRAP4
034134  012767  000357  143654          MOV     #357,RTRAP4+2           ;SET NEW ''CC'' AND PRIORITY
034142  000003                          TRT                             ;TRAP HERE
034144                          RETG4:
034144  100404                          BMI     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 721             <====
034146  012742  001024                  MOV     #1024,-(R2)             ;MOVE TO MAILBOX #  *******  1024  *******
034152  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034154  000000                          HALT                            ;N NOT SET
034156                          1$:
034156  001404                          BEQ     2$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 714             <====
034160  012742  001025                  MOV     #1025,-(R2)             ;MOVE TO MAILBOX #  *******  1025  *******
034164  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034166  000000                          HALT                            ;Z NOT SET
034170                          2$:
034170  102404                          BVS     3$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 707             <====
034172  012742  001026                  MOV     #1026,-(R2)             ;MOVE TO MAILBOX #  *******  1026  *******
034176  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034200  000000                          HALT                            ;V NOT SET
034202                          3$:
034202  103404                          BCS     4$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 702             <====
034204  012742  001027                  MOV     #1027,-(R2)             ;MOVE TO MAILBOX #  *******  1027  *******
034210  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034212  000000                          HALT                            ;C NOT SET
034214  016706  143556          4$:     MOV     CC,SP
034220  042706  000017                  BIC     #17,SP
034224  022706  000340                  CMP     #340,SP
034230  001404                          BEQ     BR51A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 667             <====
034232                          BR51:
034232  012742  001030                  MOV     #1030,-(R2)             ;MOVE TO MAILBOX #  *******  1030  *******
034236  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034240  000000                          HALT                            ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
034242  012767  000016  143544  BR51A:  MOV     #16,14
034250  005067  143542                  CLR     16
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                                        ;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
                                        ;*************************************************************************
034254  005212                          TS337:  INC     (R2)            ;UPDATE TEST NUMBER
034256  022712  000337                          CMP     #337,(R2)       ;SEQUENCE ERROR?
034262  001006                                  BNE     TS340-10        ;BR TO ERROR HALT ON SEQ ERROR
034264  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
034270  012767  034310  143506                  MOV     #RETA5,RTRAP5   ;RETURN LOCATION
034276  000100                                  JMP     %0              ;ILLEGAL INSTRUCTION, SHOULD TRAP
034300  012742  001031                          MOV     #1031,-(R2)     ;MOVE TO MAILBOX #  *******  1031  *******
034304  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034306  000000                                  HALT                    ;ILLEGAL INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
034310                                  RETA5:
                                        ;*************************************************************************
                                        ;TEST 340       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                        ;*************************************************************************
034310  005212                          TS340:  INC     (R2)            ;UPDATE TEST NUMBER
034312  022712  000340                          CMP     #340,(R2)       ;SEQUENCE ERROR?
034316  001011                                  BNE     TS341-10        ;BR TO ERROR HALT ON SEQ ERROR
034320  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
034324  012767  034334  143452                  MOV     #RETB5,RTRAP5   ;RETURN POINTER
034332  000100                                  JMP     %0              ;RESERVED INSTRUCTION
034334  020627  000774                  RETB5:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
034340  001404                                  BEQ     TS341
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
034342  012742  001032                          MOV     #1032,-(R2)     ;MOVE TO MAILBOX #  *******  1032  *******
034346  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034350  000000                                  HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;*************************************************************************
                                        ;TEST 341       TEST THAT PROPER P.C. IS SAVED
                                        ;*************************************************************************
034352  005212                          TS341:  INC     (R2)            ;UPDATE TEST NUMBER
034354  022712  000341                          CMP     #341,(R2)       ;SEQUENCE ERROR?
034360  001012                                  BNE     TS342-10        ;BR TO ERROR HALT ON SEQ ERROR
034362  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
034366  012767  034376  143410                  MOV     #RETC5,RTRAP5   ;RETURN FROM TRAP POINTER
034374  000100                                  JMP     %0              ;TRAP ON THIS INSTRUCTION
034376  022767  034376  144370          RETC5:  CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
034404  001404                                  BEQ     TS342
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 765            <====
034406  012742  001033                          MOV     #1033,-(R2)     ;MOVE TO MAILBOX #  *******  1033  *******
034412  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034414  000000                                  HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
```

```
                                                                ;  OR SEQUENCE ERROR
                                   ;*************************************************************************
                                   ;TEST 342        TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                   ;*************************************************************************
034416  005212                     TS342:  INC     (R2)                 ;UPDATE TEST NUMBER
034420  022712  000342                     CMP     #342,(R2)            ;SEQUENCE ERROR?
034424  001037                             BNE     TS343-10             ;BR TO ERROR HALT ON SEQ ERROR
034426  012706  001000                     MOV     #BUFF,SP             ;SET UP
034432  012767  034450  143344             MOV     #RETD5,RTRAP5        ;SET UP
034440  005067  143332                     CLR     CC                   ;CLEAR CC AND PRIORITY
034444  000257                             CCC
034446  000100                             JMP     %0                   ;TRAP
034450  026727  144322  000000     RETD5:  CMP     BUFF-2,#0            ;TEST THAT OLD STATUS WENT TO STACK
034456  001404                             BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 762            <====
034460  012742  001034                     MOV     #1034,-(R2)          ;MOVE TO MAILBOX #  *******  1034  *******
034464  005242                             INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
034466  000000                             HALT                         ;INCORRECT STATUS
034470  012706  001000             1$:     MOV     #BUFF,SP             ;SET UP
034474  012767  034514  143302             MOV     #RETE5,RTRAP5        ;SET UP
034502  012767  000357  143266             MOV     #357,CC              ;SET PRIORITY
034510  000277                             SCC                          ;SET CC
034512  000100                             JMP     %0                   ;TRAP
034514  026727  144256  000357     RETE5:  CMP     BUFF-2,#357          ;COMPARES STATUS ON STACK
034522  001404                             BEQ     TS343
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 740            <====
034524  012742  001035                     MOV     #1035,-(R2)          ;MOVE TO MAILBOX #  *******  1035  *******
034530  005242                             INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
034532  000000                             HALT                         ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                   ;*************************************************************************
                                   ;TEST 343        TEST THAT "NEW" STATUS IS CORRECT
                                   ;*************************************************************************
034534  005212                     TS343:  INC     (R2)                 ;UPDATE TEST NUMBER
034536  022712  000343                     CMP     #343,(R2)            ;SEQUENCE ERROR?
034542  001106                             BNE     TS344-10             ;BR TO ERROR HALT ON SEQ ERROR
034544  012706  001000                     MOV     #BUFF,SP
034550  012767  034564  143226             MOV     #RETF5,RTRAP5
034556  005067  143224                     CLR     RTRAP5+2             ;CLEAR FUTURE PRIORITY AND CC
034562  000100                             JMP     %0
034564                             RETF5:                               ;TEST FOR "C" CLEARED
034564  100004                             BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
034566  012742  001036                     MOV     #1036,-(R2)          ;MOVE TO MAILBOX #  *******  1036  *******
034572  005242                             INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
034574  000000                             HALT                         ;C NOT CLEARED
034576                             1$:
```

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034576  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
034600  012742  001037                  MOV     #1037,-(R2)     ;MOVE TO MAILBOX #  *******  1037  *******
034604  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034606  000000                          HALT                    ;Z NOT CLEARED
034610                          2$:
034610  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 754           <====
034612  012742  001040                  MOV     #1040,-(R2)     ;MOVE TO MAILBOX #  *******  1040  *******
034616  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034620  000000                          HALT                    ;V NOT CLEARED
034622                          3$:
034622  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 747           <====
034624  012742  001041                  MOV     #1041,-(R2)     ;MOVE TO MAILBOX #  *******  1041  *******
034630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034632  000000                          HALT                    ;C NOT CLEARED
034634  032767  000357  143134  4$:     BIT     #357,CC         ;TEST PRIORITY
034642  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 737           <====
034644  012742  001042                  MOV     #1042,-(R2)     ;MOVE TO MAILBOX #  *******  1042  *******
034650  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034652  000000                          HALT                    ;PRIORITY NOT ZERO
034654  012706  001000          5$:     MOV     #BUFF,SP
034660  012767  034676  143116          MOV     #RETG5,RTRAP5
034666  012767  000357  143112          MOV     #357,RTRAP5+2   ;SET NEW ''CC'' AND PRIORITY
034674  000100                          JMP     %0              ;TRAP HERE
034676                          RETG5:
034676  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 721           <====
034700  012742  001043                  MOV     #1043,-(R2)     ;MOVE TO MAILBOX #  *******  1043  *******
034704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034706  000000                          HALT                    ;N NOT SET
034710                          1$:
034710  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 714           <====
034712  012742  001044                  MOV     #1044,-(R2)     ;MOVE TO MAILBOX #  *******  1044  *******
034716  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

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034720  000000                          HALT                            ;Z NOT SET
034722                          2$:
034722  102404                          BVS     3$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 707             <====
034724  012742  001045                  MOV     #1045,-(R2)             ;MOVE TO MAILBOX #  *******  1045  *******
034730  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034732  000000                          HALT                            ;V NOT SET
034734                          3$:
034734  103404                          BCS     4$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 702             <====
034736  012742  001046                  MOV     #1046,-(R2)             ;MOVE TO MAILBOX #  *******  1046  *******
034742  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034744  000000                          HALT                            ;C NOT SET
034746  016706  143024          4$:     MOV     CC,SP
034752  022706  000357                  CMP     #357,SP
034756  001404                          BEQ     TS344
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 671             <====
034760  012742  001047                  MOV     #1047,-(R2)             ;MOVE TO MAILBOX #  *******  1047  *******
034764  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
034766  000000                          HALT                            ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                ;*****************************************************************************
                                ;TEST 344       TEST THAT A TRAP OCCURES ON ALL ILLEGAL INSTRUCION
                                ;*****************************************************************************
034770  005212                  TS344:  INC     (R2)                    ;UPDATE TEST NUMBER
034772  022712  000344                  CMP     #344,(R2)               ;SEQUENCE ERROR?
034776  001006                          BNE     TS345-10                ;BR TO ERROR HALT ON SEQ ERROR
035000  012706  001000                  MOV     #BUFF,SP                ;STACK POINTER SETUP
035004  012767  035024  142772          MOV     #RETH5,RTRAP5           ;RETURN LOCATION
035012  004000                          JSR     %0,%0                   ;RESERVED INSTRUCTION, SHOULD TRAP
035014  012742  001050                  MOV     #1050,-(R2)             ;MOVE TO MAILBOX #  *******  1050  *******
035020  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
035022  000000                          HALT                            ;DIDN'T TRAP,OR WRONG $TSTNM
035024                          RETH5:
                                ;*****************************************************************************
                                ;TEST 345       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************
035024  005212                  TS345:  INC     (R2)                    ;UPDATE TEST NUMBER
035026  022712  000345                  CMP     #345,(R2)               ;SEQUENCE ERROR?
035032  001011                          BNE     TS346-10                ;BR TO ERROR HALT ON SEQ ERROR
035034  012706  001000                  MOV     #BUFF,SP                ;STACK POINTER SETUP
035040  012767  035050  142736          MOV     #RETJ,RTRAP5            ;RETURN POINTER
035046  004000                          JSR     %0,%0                   ;RESERVED INSTRUCTION
035050  020627  000774          RETJ:   CMP     SP,#BUFF-4              ;TEST DECREMENT OF SP
035054  001404                          BEQ     TS346
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
```

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                                                                   ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;               WHICH FOLLOWS W/ 766            <====
035056  012742  001051                   MOV     #1051,-(R2)       ;MOVE TO MAILBOX #  *******  1051  *******
035062  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
035064  000000                           HALT                      ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                   ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************************
                                 ;TEST 346          TEST THAT PROPER P.C. IS SAVED
                                 ;*******************************************************************************************
035066  005212                   TS346:  INC     (R2)              ;UPDATE TEST NUMBER
035070  022712  000346                   CMP     #346,(R2)         ;SEQUENCE ERROR?
035074  001012                           BNE     TS347-10          ;BR TO ERROR HALT ON SEQ ERROR
035076  012706  001000                   MOV     #BUFF,SP          ;STACK POINTER SETUP
035102  012767  035112  142674           MOV     #RETK,RTRAP5      ;RETURN FROM TRAP POINTER
035110  004000                   INSTK:  JSR     %0,%0             ;TRAP ON THIS INSTRUCTION
035112  022767  035112  143654   RETK:   CMP     #INSTK+2,BUFF-4   ;CHECK FOR INCREMENED P.C.
035120  001404                           BEQ     TS347
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                   ;           CONDITIONAL BRANCH INST. AND        <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION        <====
                                                                   ;           WHICH FOLLOWS W/ 765                <====
035122  012742  001052                   MOV     #1052,-(R2)       ;MOVE TO MAILBOX #  *******  1052  *******
035126  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
035130  000000                           HALT                      ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                   ;  OR SEQUENCE ERROR

                                 ;*******************************************************************************************
                                 ;TEST 347          TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                 ;*******************************************************************************************
035132  005212                   TS347:  INC     (R2)              ;UPDATE TEST NUMBER
035134  022712  000347                   CMP     #347,(R2)         ;SEQUENCE ERROR?
035140  001037                           BNE     TS350-10          ;BR TO ERROR HALT ON SEQ ERROR
035142  012706  001000                   MOV     #BUFF,SP          ;SET UP
035146  012767  035164  142630           MOV     #RETL,RTRAP5      ;SET UP
035154  005067  142616                   CLR     CC                ;CLEAR CC AND PRIORITY
035160  000257                           CCC
035162  004000                           JSR     %0,%0             ;TRAP
035164  026727  143606  000000   RETL:   CMP     BUFF-2,#0         ;TEST THAT OLD STATUS WENT TO STACK
035172  001404                           BEQ     1$
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                   ;           CONDITIONAL BRANCH INST. AND        <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION        <====
                                                                   ;           WHICH FOLLOWS W/ 762                <====
035174  012742  001053                   MOV     #1053,-(R2)       ;MOVE TO MAILBOX #  *******  1053  *******
035200  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
035202  000000                           HALT                      ;INCORRCT STATUS
035204  012706  001000           1$:     MOV     #BUFF,SP          ;SET UP
035210  012767  035230  142566           MOV     #RETM,RTRAP5      ;SET UP
035216  012767  000357  142552           MOV     #357,CC           ;SET PRIORITY
035224  000277                           SCC                       ;SET CC
035226  004000                           JSR     %0,%0             ;TRAP
035230  026727  143542  000357   RETM:   CMP     BUFF-2,#357       ;COMPARES STATUS ON STACK
035236  001404                           BEQ     TS350
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                   ;           CONDITIONAL BRANCH INST. AND        <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION        <====
```

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                                                          ;               WHICH FOLLOWS W/ 740      <====
035240  012742  001054              MOV     #1054,-(R2)   ;MOVE TO MAILBOX #  *******  1054  *******
035244  005242                      INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
035246  000000                      HALT                  ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                          ;   OR SEQUENCE ERROR
                            ;*************************************************************************
                            ;TEST 350        TEST THAT "NEW" STATUS IS CORRECT
                            ;*************************************************************************
035250  005212              TS350:  INC     (R2)          ;UPDATE TEST NUMBER
035252  022712  000350              CMP     #350,(R2)     ;SEQUENCE ERROR?
035256  001105                      BNE     TS351-10      ;BR TO ERROR HALT ON SEQ ERROR
035260  012706  001000              MOV     #BUFF,SP
035264  012767  035300  142512      MOV     #RETN,RTRAP5
035272  005067  142510              CLR     RTRAP5+2      ;CLEAR FUTURE PRIORITY AND CC
035276  004000                      JSR     %0,%0
035300                      RETN:                         ;TEST FOR "C" CLEARED
035300  100004                      BPL     1$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 766          <====
035302  012742  001055              MOV     #1055,-(R2)   ;MOVE TO MAILBOX #  *******  1055  *******
035306  005242                      INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
035310  000000                      HALT                  ;C NOT CLEARED
035312                      1$:
035312  001004                      BNE     2$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 761          <====
035314  012742  001056              MOV     #1056,-(R2)   ;MOVE TO MAILBOX #  *******  1056  *******
035320  005242                      INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
035322  000000                      HALT                  ;Z NOT CLEARED
035324                      2$:
035324  102004                      BVC     3$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 754          <====
035326  012742  001057              MOV     #1057,-(R2)   ;MOVE TO MAILBOX #  *******  1057  *******
035332  005242                      INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
035334  000000                      HALT                  ;V NOT CLEARED
035336                      3$:
035336  103004                      BCC     4$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 747          <====
035340  012742  001060              MOV     #1060,-(R2)   ;MOVE TO MAILBOX #  *******  1060  *******
035344  005242                      INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
035346  000000                      HALT                  ;C NOT CLEARED
035350  016700  142422      4$:     MOV     CC,%0         ;TEMP STORAGE
035354  001404                      BEQ     5$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
```

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                                                                       ;              WHICH FOLLOWS W/ 740           <====
035356  012742  001061                  MOV     #1061,-(R2)            ;MOVE TO MAILBOX #  *******  1061  *******
035362  005242                          INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
035364  000000                          HALT                           ;PRIORITY NOT ZERO
035366  012706  001000          5$:     MOV     #BUFF,SP
035372  012767  035410  142404          MOV     #RETO,RTRAP5
035400  012767  000357  142400          MOV     #357,RTRAP5+2          ;SET NEW "CC" AND PRIORITY
035406  004000                          JSR     %0,%0                  ;TRAP HERE
035410                          RETO:
035410  100404                          BMI     1$
                                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                       ;           CONDITIONAL BRANCH INST. AND      <====
                                                                       ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                       ;           WHICH FOLLOWS W/ 722              <====
035412  012742  001062                  MOV     #1062,-(R2)            ;MOVE TO MAILBOX #  *******  1062  *******
035416  005242                          INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
035420  000000                          HALT                           ;N NOT SET
035422                          1$:
035422  001404                          BEQ     2$
                                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                       ;           CONDITIONAL BRANCH INST. AND      <====
                                                                       ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                       ;           WHICH FOLLOWS W/ 715              <====
035424  012742  001063                  MOV     #1063,-(R2)            ;MOVE TO MAILBOX #  *******  1063  *******
035430  005242                          INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
035432  000000                          HALT                           ;Z NOT SET
035434                          2$:
035434  102404                          BVS     3$
                                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                       ;           CONDITIONAL BRANCH INST. AND      <====
                                                                       ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                       ;           WHICH FOLLOWS W/ 710              <====
035436  012742  001064                  MOV     #1064,-(R2)            ;MOVE TO MAILBOX #  *******  1064  *******
035442  005242                          INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
035444  000000                          HALT                           ;V NOT SET
035446                          3$:
035446  103404                          BCS     4$
                                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                       ;           CONDITIONAL BRANCH INST. AND      <====
                                                                       ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                       ;           WHICH FOLLOWS W/ 703              <====
035450  012742  001065                  MOV     #1065,-(R2)            ;MOVE TO MAILBOX #  *******  1065  *******
035454  005242                          INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
035456  000000                          HALT                           ;C NOT SET
035460  016700  142312          4$:     MOV     CC,%0
035464  022700  000357                  CMP     #357,%0
035470  001404                          BEQ     TS351
                                                                       ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                       ;           CONDITIONAL BRANCH INST. AND      <====
                                                                       ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                       ;           WHICH FOLLOWS W/ 672              <====
035472  012742  001066                  MOV     #1066,-(R2)            ;MOVE TO MAILBOX #  *******  1066  *******
035476  005242                          INC     -(R2)                  ;SET MSGTYP TO FATAL ERROR
035500  000000                          HALT                           ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                       ;  OR SEQUENCE ERROR
```

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                                        ;*******************************************************************************
                                        ;TEST 351        TEST THAT DECREMENT R6 TO A VALUE LESS THAN 400 TRAPS
                                        ;*******************************************************************************
035502  005212                          TS351:  INC     (R2)            ;UPDATE TEST NUMBER
035504  022712  000351                          CMP     #351,(R2)       ;SEQUENCE ERROR?
035510  001006                                  BNE     TS352-10        ;BR TO ERROR HALT ON SEQ ERROR
035512  012706  000150                          MOV     #150,%6         ;R6 = 150
035516  012767  035536  142260                  MOV     #TDEC1,4        ;STACK OVERFLOW TRAP POINTER
035524  005746                                  TST     -(6)            ;WITH R6 = 150 SHOULD TRAP
035526  012742  001067                          MOV     #1067,-(R2)     ;MOVE TO MAILBOX #  *******  1067  *******
035532  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035534  000000                                  HALT                    ;SHOULD HAVE TRAPPED,OR WRONG $TSTNM
035536                                  TDEC1:

                                        ;*******************************************************************************
                                        ;TEST 352        TEST FOR DECREMENT OF R6 ON OVERFLOW TRAP
                                        ;*******************************************************************************
035536  005212                          TS352:  INC     (R2)            ;UPDATE TEST NUMBER
035540  022712  000352                          CMP     #352,(R2)       ;SEQUENCE ERROR?
035544  001011                                  BNE     TS353-10        ;BR TO ERROR HALT ON SEQ ERROR
035546  012706  000150                          MOV     #150,%6         ;R6 = 150
035552  012767  035562  142224                  MOV     #TDEC2,4        ;TRAP POINTER
035560  005746                                  TST     -(6)            ;WITH R6 = 150 SHOULD TRAP
035562  020627  000142                  TDEC2:  CMP     %6,#142         ;DID R6 DECREMENT
035566  001404                                  BEQ     TS353
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 766             <====
035570  012742  001070                          MOV     #1070,-(R2)     ;MOVE TO MAILBOX #  *******  1070  *******
035574  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035576  000000                                  HALT                    ;R6 NOT = 142,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR

                                        ;*******************************************************************************
                                        ;TEST 353        TEST DIFFERENT TYPES OF OVERFLOW
                                        ;*******************************************************************************
035600  005212                          TS353:  INC     (R2)            ;UPDATE TEST NUMBER
035602  022712  000353                          CMP     #353,(R2)       ;SEQUENCE ERROR?
035606  001041                                  BNE     TS354-10        ;BR TO ERROR HALT ON SEQ ERROR
035610  012706  000150                          MOV     #150,%6
035614  005067  142326                          CLR     146             ;STATUS WORD OF LOC 10
035620  012767  035630  142156                  MOV     #TDEC3,4        ;RETURN TO LOC 4
035626  005246                                  INC     -(6)
035630  005767  142312                  TDEC3:  TST     146
035634  001004                                  BNE     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 764             <====
035636  012742  001071                          MOV     #1071,-(R2)     ;MOVE TO MAILBOX #  *******  1071  *******
035642  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035644  000000                                  HALT                    ;INCREMENT OPERATION NOT INHIBITED
035646  012705  001000                  1$:     MOV     #1000,%5
035652  012706  000400                          MOV     #400,%6
035656  012767  035676  142120                  MOV     #TDEC4,4
```

```
035664  124645                          CMPB    -(6),-(5)
035666  012742  001072                  MOV     #1072,-(R2)     ;MOVE TO MAILBOX #  *******  1072  *******
035672  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035674  000000                          HALT                    ;STACK = 400 AND DECREMENTED, SHOULD TRAP
035676  012706  000400          TDEC4:  MOV     #400,%6
035702  012767  035722  142074          MOV     #TDEC7,4
035710  134546                          BITB    -(5),-(6)
035712                          TDEC6:
035712  012742  001073                  MOV     #1073,-(R2)     ;MOVE TO MAILBOX #  *******  1073  *******
035716  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035720  000000                          HALT                    ;NO STACK OVERFLOW,OR WRONG $TSTNM
035722                          TDEC7:

                                ;*******************************************************************************
                                ;TEST 354       TEST THAT AN 77 CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
035722  005212                  TS354:  INC     (R2)            ;UPDATE TEST NUMBER
035724  022712  000354                  CMP     #354,(R2)       ;SEQUENCE ERROR?
035730  001011                          BNE     VDEC2           ;BR TO ERROR HALT ON SEQ ERROR
035732  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
035736  012767  035754  142044          MOV     #VDEC2,10       ;SET UP 77 VECTOR
035744  012767  035764  142032          MOV     #VDEC1,4        ;SET UP OVERFLOW VECTOR
035752  000077                          77                      ;THIS TRAP SHOULD CAUSE OVERFLOW
035754                          VDEC2:
035754  012742  001074                  MOV     #1074,-(R2)     ;MOVE TO MAILBOX #  *******  1074  *******
035760  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035762  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
035764  012767  000012  142016  VDEC1:  MOV     #10+2,10
                                ;*******************************************************************************
                                ;TEST 355       TEST THAT AN IOT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
035772  005212                  TS355:  INC     (R2)            ;UPDATE TEST NUMBER
035774  022712  000355                  CMP     #355,(R2)       ;SEQUENCE ERROR?
036000  001011                          BNE     VDEC4           ;BR TO ERROR HALT ON SEQ ERROR
036002  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036006  012767  036024  142004          MOV     #VDEC4,20       ;SET UP IOT VECTOR
036014  012767  036034  141762          MOV     #VDEC3,4        ;SET UP OVERFLOW VECTOR
036022  000004                          IOT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
036024                          VDEC4:
036024  012742  001075                  MOV     #1075,-(R2)     ;MOVE TO MAILBOX #  *******  1075  *******
036030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036032  000000                          HALT                    ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036034  012767  000022  141756  VDEC3:  MOV     #20+2,20
                                ;*******************************************************************************
                                ;TEST 356       TEST THAT AN EMT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036042  005212                  TS356:  INC     (R2)            ;UPDATE TEST NUMBER
036044  022712  000356                  CMP     #356,(R2)       ;SEQUENCE ERROR?
036050  001011                          BNE     VDEC6           ;BR TO ERROR HALT ON SEQ ERROR
036052  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
036056  012767  036074  141744          MOV     #VDEC6,30       ;SET UP EMT VECTOR
036064  012767  036104  141712          MOV     #VDEC5,4        ;SET UP OVERFLOW VECTOR
036072  104000                          EMT                     ;THIS TRAP SHOULD CAUSE OVERFLOW
036074                          VDEC6:
036074  012742  001076                  MOV     #1076,-(R2)     ;MOVE TO MAILBOX #  *******  1076  *******
036100  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
036102  000000                           HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036104  012767  000032  141716  VDEC5:   MOV     #30+2,30
                                ;*************************************************************************************
                                ;TEST 357        TEST THAT AN TRAP CAUSES AN OVERFLOW TRAP
                                ;*************************************************************************************
036112  005212                  TS357:   INC     (R2)                    ;UPDATE TEST NUMBER
036114  022712  000357                   CMP     #357,(R2)               ;SEQUENCE ERROR?
036120  001011                           BNE     VDEC8                   ;BR TO ERROR HALT ON SEQ ERROR
036122  012706  000400                   MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036126  012767  036144  141700           MOV     #VDEC8,34               ;SET UP TRAP VECTOR
036134  012767  036154  141642           MOV     #VDEC7,4                ;SET UP OVERFLOW VECTOR
036142  104400                           TRAP                            ;THIS TRAP SHOULD CAUSE OVERFLOW
036144                          VDEC8:
036144  012742  001077                   MOV     #1077,-(R2)             ;MOVE TO MAILBOX #  *******  1077  *******
036150  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036152  000000                           HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036154  012767  000036  141652  VDEC7:   MOV     #34+2,34
                                ;*************************************************************************************
                                ;TEST 360        TEST THAT AN TRT CAUSES AN OVERFLOW TRAP
                                ;*************************************************************************************
036162  005212                  TS360:   INC     (R2)                    ;UPDATE TEST NUMBER
036164  022712  000360                   CMP     #360,(R2)               ;SEQUENCE ERROR?
036170  001011                           BNE     VDEC10                  ;BR TO ERROR HALT ON SEQ ERROR
036172  012706  000400                   MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036176  012767  036214  141610           MOV     #VDEC10,14              ;SET UP TRT VECTOR
036204  012767  036224  141572           MOV     #VDEC9,4                ;SET UP OVERFLOW VECTOR
036212  000003                           TRT                             ;THIS TRAP SHOULD CAUSE OVERFLOW
036214                          VDEC10:
036214  012742  001100                   MOV     #1100,-(R2)             ;MOVE TO MAILBOX #  *******  1100  *******
036220  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036222  000000                           HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036224  012767  000016  141562  VDEC9:   MOV     #14+2,14
                                ;*************************************************************************************
                                ;TEST 361        TEST THAT AN ILLA CAUSES AN OVERFLOW TRAP
                                ;*************************************************************************************
036232  005212                  TS361:   INC     (R2)                    ;UPDATE TEST NUMBER
036234  022712  000361                   CMP     #361,(R2)               ;SEQUENCE ERROR?
036240  001011                           BNE     VDEC11                  ;BR TO ERROR HALT ON SEQ ERROR
036242  012706  000400                   MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036246  012767  036264  141530           MOV     #VDEC11,4               ;SET UP ILLA VECTOR
036254  012767  036274  141522           MOV     #VDEC12,4               ;SET UP OVERFLOW VECTOR
036262  004700                           ILLA                            ;THIS TRAP SHOULD CAUSE OVERFLOW
036264                          VDEC11:
036264  012742  001101                   MOV     #1101,-(R2)             ;MOVE TO MAILBOX #  *******  1101  *******
036270  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036272  000000                           HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036274  012767  000006  141502  VDEC12:  MOV     #4+2,4
036302  020627  000370                   CMP     %6,#370                 ;STACK PUSHED FOUR WORDS?
036306  001404                           BEQ     TS362
                                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                         ;           CONDITIONAL BRANCH INST. AND    <====
                                                                         ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                         ;           WHICH FOLLOWS W/ 754            <====
036310  012742  001102                   MOV     #1102,-(R2)             ;MOVE TO MAILBOX #  *******  1102  *******
036314  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036316  000000                           HALT                            ;TRAP OVERFLOW DID NOT OCCUR
```

```
                                                                         ;  OR SEQUENCE ERROR
                                         ;*****************************************************************************
                                         ;TEST 362         TEST THAT AN ILLB CAUSES AN OVERFLOW TRAP
                                         ;*****************************************************************************
 036320  005212                          TS362:  INC     (R2)                ;UPDATE TEST NUMBER
 036322  022712  000362                          CMP     #362,(R2)           ;SEQUENCE ERROR?
 036326  001011                                  BNE     VDEC13              ;BR TO ERROR HALT ON SEQ ERROR
 036330  012706  000400                          MOV     #400,%6             ;SET UP STACK TO OVERFLOW
 036334  012767  036352  141442                  MOV     #VDEC13,4           ;SET UP ILLB VECTOR
 036342  012767  036362  141434                  MOV     #VDEC14,4           ;SET UP OVERFLOW VECTOR
 036350  000100                                  ILLB                        ;THIS TRAP SHOULD CAUSE OVERFLOW
 036352                                  VDEC13:
 036352  012742  001103                          MOV     #1103,-(R2)         ;MOVE TO MAILBOX #  *******  1103  *******
 036356  005242                                  INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
 036360  000000                                  HALT                        ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
 036362  012767  000006  141414          VDEC14: MOV     #4+2,4

                                         ;*****************************************************************************
                                         ;TEST 363         TEST FOR FALSE OVERFLOW TRAP
                                         ;*****************************************************************************
 036370  005212                          TS363:  INC     (R2)                ;UPDATE TEST NUMBER
 036372  022712  000363                          CMP     #363,(R2)           ;SEQUENCE ERROR?
 036376  001023                                  BNE     FOVER               ;BR TO ERROR HALT ON SEQ ERROR

 036400  012767  036446  141376                  MOV     #FOVER,4            ;SET UP OVERFLOW POINTER
 036406  012706  001002                          MOV     #1002,%6
 036412  005746                                  TST     -(6)                ;SHOULD NOT OVERFLOW
 036414  012706  002002                          MOV     #2002,%6
 036420  005746                                  TST     -(6)                ;SHOULD NOT OVERFLOW
 036422  012706  004002                          MOV     #4002,%6
 036426  005746                                  TST     -(6)                ;SHOULD NOT OVERFLOW
 036430  012706  010002                          MOV     #10002,%6
 036434  005746                                  TST     -(6)
 036436  012706  020000                          MOV     #20000,%6           ;SHOULD NOT OVERFLOW
 036442  005746                                  TST     -(6)
 036444  000404                                  BR      STP
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                     ;           CONDITIONAL BRANCH INST. AND     <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                     ;           WHICH FOLLOWS W/ 754             <====
 036446                                  FOVER:
 036446  012742  001104                          MOV     #1104,-(R2)         ;MOVE TO MAILBOX #  *******  1104  *******
 036452  005242                                  INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
 036454  000000                                  HALT                        ;IT OVERFLOWED,OR WRONG $TSTNM
```

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036456 012767 000006 141320 STP:    MOV     #6,4
036464 005067 141316                CLR     6
                                ;*******************************************************************************
                                ;TEST 364       TEST THAT BIT 4 PSW WILL CAUSE A TRAP TO 14
                                ;*******************************************************************************
036470 005212                   TS364:  INC     (R2)                    ;UPDATE TEST NUMBER
036472 022712 000364                    CMP     #364,(R2)               ;SEQUENCE ERROR?
036476 001013                           BNE     TS365-10                ;BR TO ERROR HALT ON SEQ ERROR
036500 012706 001000                    MOV     #BUFF,SP
036504 012767 036536 141302             MOV     #RETAT,RTRAP4           ;SET UP TO TRAP TO 14
036512 012746 000020                    MOV     #20,-(SP)               ;PUSH T BIT
036516 012746 036524                    MOV     #.+6,-(SP)              ;PUSH PC
036522 000002                           RTI                             ;SET T BIT
036524 000240                           NOP                             ;TRAP HERE
036526 012742 001105                    MOV     #1105,-(R2)             ;MOVE TO MAILBOX #  *******  1105  *******
036532 005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036534 000000                           HALT                            ;TRACE BIT DID NOT TRAP!,OR WRONG $TESTN
036536                          RETAT:
                                ;*******************************************************************************
                                ;TEST 365       TEST  STACK POINTER DECREMENTS
                                ;*******************************************************************************
036536 005212                   TS365:  INC     (R2)                    ;UPDATE TEST NUMBER
036540 022712 000365                    CMP     #365,(R2)               ;SEQUENCE ERROR?
036544 001022                           BNE     TS366-10                ;BR TO ERROR HALT ON SEQ ERROR
036546 012706 001000                    MOV     #BUFF,SP
036552 012767 036604 141234             MOV     #RETBT,RTRAP4
036560 012746 000020                    MOV     #20,-(SP)               ;PUSH T BIT
036564 012746 036572                    MOV     #.+6,-(SP)              ;PUSH PC
036570 000002                           RTI                             ;SET T BIT
036572 000240                           NOP                             ;TRAP HERE
036574 012742 001106                    MOV     #1106,-(R2)             ;MOVE TO MAILBOX #  *******  1106  *******
036600 005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036602 000000                           HALT                            ;TRACE BIT DID NOT TRAP!
036604 020627 000774            RETBT:  CMP     SP,#BUFF-4
036610 001404                           BEQ     TS366
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 755           <====
036612 012742 001107                    MOV     #1107,-(R2)             ;MOVE TO MAILBOX #  *******  1107  *******
036616 005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036620 000000                           HALT                            ;STACK POINTER WAS NOT PUSHED BY TRAP,OR WRONG $TESTN
                                                                        ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 366       TEST  FOR PROPER PC ON STACK
                                ;*******************************************************************************
036622 005212                   TS366:  INC     (R2)                    ;UPDATE TEST NUMBER
036624 022712 000366                    CMP     #366,(R2)               ;SEQUENCE ERROR?
036630 001016                           BNE     TS367-10                ;BR TO ERROR HALT ON SEQ ERROR
036632 012706 001000                    MOV     #BUFF,SP
036636 012767 036656 141150             MOV     #RETCT,RTRAP4
036644 012746 000020                    MOV     #20,-(SP)               ;PUSH T BIT
036650 012746 036656                    MOV     #.+6,-(SP)              ;PUSH PC
036654 000002                           RTI                             ;SET T BIT
                                                                        ;TRAP HERE
036656 022767 036656 142110     RETCT:  CMP     #.,BUFF-4
```

```
036664  001404                             BEQ     TS367
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 761             <====
036666  012742  001110                     MOV     #1110,-(R2)     ;MOVE TO MAILBOX #  *******  1110  *******
036672  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036674  000000                             HALT                    ;CORRECT PC WAS NOT SAVED ON STACK,OR WRONG $TESTN
                                                                   ;  OR SEQUENCE ERROR



                                   ;*******************************************************************************
                                   ;TEST 367          TEST  THAT RTT POPS T- BIT
                                   ;*******************************************************************************
036676  005212                     TS367:  INC     (R2)            ;UPDATE TEST NUMBER
036700  022712  000367                     CMP     #367,(R2)       ;SEQUENCE ERROR?
036704  001015                             BNE     TS370-10        ;BR TO ERROR HALT ON SEQ ERROR

036706  012706  001000                     MOV     #BUFF,SP
036712  005001                             CLR     R1              ;CLEAR R1
036714  012746  000020                     MOV     #20,-(SP)
036720  012746  036734                     MOV     #RTT1,-(SP)
036724  012767  036750  141062             MOV     #RTT2,14
036732  000006                             RTT
036734  000240                     RTT1:   NOP
036736  001404                             BEQ     TS370
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 762             <====
036740  012742  001111                     MOV     #1111,-(R2)     ;MOVE TO MAILBOX #  *******  1111  *******
036744  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
036746  000000                             HALT                    ;T-BIT DID NOT TRAP,OR WRONG $TESTN
                                                                   ;  OR SEQUENCE ERROR


036750                             RTT2:
                                   ;*******************************************************************************
                                   ;TEST 370          TEST  THAT RTT ALLOWS ONE INST. BEFORE TRAP
                                   ;*******************************************************************************
036750  005212                     TS370:  INC     (R2)            ;UPDATE TEST NUMBER
036752  022712  000370                     CMP     #370,(R2)       ;SEQUENCE ERROR?
036756  001030                             BNE     TS371-10        ;BR TO ERROR HALT ON SEQ ERROR
036760  012705  177777                     MOV     #177777,%5
036764  012706  001000             RTT5:   MOV     #BUFF,SP
036770  012746  000020                     MOV     #20,-(SP)
036774  012746  037012                     MOV     #RTT3,-(SP)
037000  012767  037030  141006             MOV     #RTT4,14
037006  005001                             CLR     R1              ;CLEAR R0
037010  000006                             RTT                     ;SET T-BIT
037012  005201                     RTT3:   INC     R1
037014  005205                             INC     %5
037016  001762                             BEQ     RTT5            ;DO THIS TEST NO MORE THAN 2 TIMES
037020  012742  001112                     MOV     #1112,-(R2)     ;MOVE TO MAILBOX #  *******  1112  *******
037024  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037026  000000                             HALT                    ;DID NOT TRAP
037030  005301                     RTT4:   DEC     P1              ;SEE IF RTT ALLOWS 1 INST.
```

```
037032  001406                          BEQ     RTT6
037034  005205                          INC     %5                  ;DO THIS TEST NO MORE THAN TWO TIMES
037036  001752                          BEQ     RTT5
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 747            <====
037040  012742  001113                  MOV     #1113,-(R2)         ;MOVE TO MAILBOX #  *******  1113  *******
037044  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
037046  000000                          HALT                        ;RTT DID NOT ALLOW 1 INST.,OR WRONG $TESTN
037050                          RTT6:
                                ;*******************************************************************************
                                ;TEST 371       TEST  THAT RTI DOES NOT ALLOW 1 INST.
                                ;*******************************************************************************
037050  005212                  TS371:  INC     (R2)                ;UPDATE TEST NUMBER
037052  022712  000371                  CMP     #371,(R2)           ;SEQUENCE ERROR?
037056  001022                          BNE     TS372-10            ;BR TO ERROR HALT ON SEQ ERROR
037060  012706  001000                  MOV     #BUFF,SP
037064  012746  000020                  MOV     #20,-(SP)
037070  012746  037106                  MOV     #RTI1,-(SP)
037074  012767  037120  140712          MOV     #RTI2,14
037102  005001                          CLR     R1
037104  000002                          RTI                         ;SET T-BIT
037106  005201                  RTI1:   INC     R1                  ;RTI SHOULD NOT ALLOW THIS
037110  012742  001114                  MOV     #1114,-(R2)         ;MOVE TO MAILBOX #  *******  1114  *******
037114  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
037116  000000                          HALT                        ;T- BIT DID NOT CAUSE TRAP
037120  005701                  RTI2:   TST     R1
                                                                    ;RTI SHOULD NOT ALLOW 1 INST. BEFORE TRAP
037122  001404                          BEQ     TS372
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 755            <====
037124  012742  001115                  MOV     #1115,-(R2)         ;MOVE TO MAILBOX #  *******  1115  *******
037130  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
037132  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
                                ;*******************************************************************************
037134  005212                  TS372:  INC     (R2)                ;UPDATE TEST NUMBER
037136  022712  000372                  CMP     #372,(R2)           ;SEQUENCE ERROR?
037142  001026                          BNE     BR70                ;BR TO ERROR HALT ON SEQ ERROR

037144  012706  001000                  MOV     #BUFF,%6
037150  012767  037210  140636          MOV     #TRACE,14           ;TRACE TRAP
037156  005027  000016                  CLR     #16
037162  005027  000022                  CLR     #22
037166  012767  037230  140624          MOV     #TONT1,20           ;IOT TRAP
037174  012746  000020                  MOV     #20,-(SP)           ;PUSH T BIT
037200  012746  037206                  MOV     #.+6,-(SP)          ;PUSH PC
037204  000006                          RTT
037206  000004                          IOT                         ;TRAP, NEW CC HAVE TRACE RESET
037210                          TRACE:
```

```
037210  012742  001116                          MOV     #1116,-(R2)     ;MOVE TO MAILBOX #  *******  1116  *******
037214  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037216  000000                                  HALT                    ;TRACE TRAP WAS NOT INHIBITED
037220                                  BR70:
037220  012742  001117                          MOV     #1117,-(R2)     ;MOVE TO MAILBOX #  *******  1117  *******
037224  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037226  000000                                  HALT                    ;WRONG TSTNM,OR WRONG $TSTNM
037230  012767  000016  140556  TONT1:  MOV     #16,14
037236  012767  000022  140554          MOV     #22,20
                                        ;*************************************************************************************
                                        ;TEST 373       TEST THAT THE TRACE BIT IS SAVED IN THE STACK
                                        ;*************************************************************************************
037244  005212                          TS373:  INC     (R2)            ;UPDATE TEST NUMBER
037246  022712  000373                          CMP     #373,(R2)       ;SEQUENCE ERROR?
037252  001020                                  BNE     STP3            ;BR TO ERROR HALT ON SEQ ERROR
037254  012706  001000                          MOV     #BUFF,%6        ;SET UP STACK POINTER
037260  012767  037304  140526                  MOV     #TRC1,14        ;TRACE TRAP RETURN
037266  005067  140524                          CLR     16
037272  012746  000020                          MOV     #20,-(SP)       ;SET THE T BIT
037276  012746  037304                          MOV     #TRC1,-(SP)
037302  000002                                  RTI
037304  036727  141466  000020  TRC1:   BIT     BUFF-2,#20      ;CHECK FOR T BIT ON STACK
037312  001004                                  BNE     STP3D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 757             <====
037314                                  STP3:
037314  012742  001120                          MOV     #1120,-(R2)     ;MOVE TO MAILBOX #  *******  1120  *******
037320  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037322  000000                                  HALT                    ;T BIT NOT SAVED ON THE STACK,OR WRONG $TSTNM
037324  012767  000016  140462  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
                                        ;*************************************************************************************
037332  005212                          TS374:  INC     (R2)            ;UPDATE TEST NUMBER
037334  022712  000374                          CMP     #374,(R2)       ;SEQUENCE ERROR?
037340  001150                                  BNE     TS375-10        ;BR TO ERROR HALT ON SEQ ERROR
037342  042737  010000  037412                  BIC     #10000,@#HICORE ;SET HIGHT CORE LIMIT TO 160000
037350  032737  000002  000322                  BIT     #2,@#$SWREG     ;CHECK IF BIT 1 IS SET
037356  001403                                  BEQ     1$              ;BRANCH IF IT IS, LEAVE LIMIT=160000
037360  052737  010000  037412                  BIS     #10000,@#HICORE ;SET UPPER CORE LIMIT TO 30K (170000)
037366  005000                          1$:     CLR     R0              ;
037370  005067  140412                          CLR     6               ;
037374  012767  037502  140402                  MOV     #ATRAP,4        ;SET UP ADDRESS TRAP ENTRANCE
```

```
037402 012706 001000                 MOV     #BUFF,SP          ;SET STACK POINTER
037406 105720                NOR:    TSTB    (0)+              ;IF OUTSIDE OF CORE, TRAP TO 4
037410 020027                        CMP     R0,(PC)+          ;IS POINTER INSIDE 28K (30K) CORE
037412 160000                HICORE: .WORD   160000            ;MAY BE CHANGED TO 170000 IF 30K
037414 103774                        BLO     NOR               ;TEST THE REST OF CORE
037416 012737 037440 000004          MOV     #ROTRAP,@#4       ;SET UP NEW VECTOR POINTER
037424 105737 177700                 TSTB    @#177700          ;SHOULD CAUSE A TRAP
037430                       TRPADR:
037430 012742 001121                 MOV     #1121,-(R2)       ;MOVE TO MAILBOX #  *******  1121  *******
037434 005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
037436 000000                        HALT                      ;SHOULD HAVE TRAPED
                             ;TRAP TO HERE IF FORCING TRAP BY TESTING 177700
037440 106767 140332         ROTRAP: MFPS    STATUS
037444 005767 140326                 TST     STATUS            ;TEST PSW
037450 001404                        BEQ     1$
                                                               ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                               ;           CONDITIONAL BRANCH INST. AND   <====
                                                               ;           REPLACE THE MOVE INSTRUCTION   <====
                                                               ;           WHICH FOLLOWS W/ 733           <====
037452 012742 001122                 MOV     #1122,-(R2)       ;MOVE TO MAILBOX #  *******  1122  *******
037456 005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
037460 000000                        HALT                      ;NEW PSW SHOULD HAVE BEEN ZERO
037462 026727 141306 037430  1$:     CMP     BUFF-4,#TRPADR    ;TEST OLD PC AT STACK
037470 001453                        BEQ     TRAPB
                                                               ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                               ;           CONDITIONAL BRANCH INST. AND   <====
                                                               ;           REPLACE THE MOVE INSTRUCTION   <====
                                                               ;           WHICH FOLLOWS W/ 723           <====
037472 012742 001123                 MOV     #1123,-(R2)       ;MOVE TO MAILBOX #  *******  1123  *******
037476 005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
037500 000000                        HALT                      ;OLD PC WAS NOT SAVED
                             ;RETURN HERE ON AN ADDRESS TRAP FROM MEMORY BELOW 28K (OR 30K)
037502 005300                ATRAP:  DEC     R0                ;
037504 010067 000032                 MOV     R0,CORH           ;MOVE THE FIRST NXM LOCATION IN CORH
                             ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTENT MEMORY LOCATION
037510 013700 037412                 MOV     @#HICORE,R0       ;SET UP THE HIGHEST MEM LOCATION
037514 005300                        DEC     R0                ;MAKE 1 LESS THAN THE HIGHEST CORE BOUNDARY
037516 000402                        BR      NOSUB             ;DON'T SUBTRACT 1K FIRST TIME
037520 162700 001000         CTRAP:  SUB     #1000,R0          ;SUBTRACT 1K OCTAL BYTE FROM ADDRESS
                                                               ;TO SPEED UP TESTING
037524 012767 037556 140252  NOSUB:  MOV     #BTRAP,4          ;SET UP THE VECTOR
037532 012706 001000                 MOV     #BUFF,SP
037536 005710                        TST     (R0)              ;DOES THIS MEMORY EXIST?
                                                               ;IF NXM, TRAP TO BTRAP
037540 020027                DTRAP1: CMP     R0,(PC)+          ;IF EXISTS, IS THIS THE SAME TRAP THAT CAUSED
                                                               ;TRAP TO ATRAP
037542 000000                CORH:   .WORD   0
037544 101425                        BLOS    TRAPB
                                                               ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                               ;           CONDITIONAL BRANCH INST. AND   <====
                                                               ;           REPLACE THE MOVE INSTRUCTION   <====
                                                               ;           WHICH FOLLOWS W/ 675           <====
037546 012742 001124                 MOV     #1124,-(R2)       ;MOVE TO MAILBOX #  *******  1124  *******
037552 005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
037554 000000                        HALT                      ;CONTENTS OF R0 SHOULD BE LESS THAN OR EQUAL  TO CORH
                                                               ;IF THIS COMPARISON FAILS IT MEANS
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                                                                ;THAT SOME LEGAL ADDRESS TRAPPED, OR
                                                                ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
037556  106767  140214          BTRAP:  MFPS    STATUS
037562  005767  140210                  TST     STATUS
037566  001404                          BEQ     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 664           <====
037570  012742  001125                  MOV     #1125,-(R2)     ;MOVE TO MAILBOX #  *******  1125  *******
037574  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037576  000000                          HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
037600  026727  141170  037540  1$:     CMP     BUFF-4,#DTRAP1  ;CHECK IF TRAP PC IS OK
037606  001744                          BEQ     CTRAP
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 654           <====
037610                          AUTO1:
037610  012742  001126                  MOV     #1126,-(R2)     ;MOVE TO MAILBOX #  *******  1126  *******
037614  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037616  000000                          HALT                    ;OLD PC WAS NOT SAVED OR WRONG $TESTN
037620  012767  000006  140156  TRAPB:  MOV     #6,4            ;RESET TRAP CATCHER
037626  005067  140154                  CLR     6               ;RESET TRAP CATCHER


                                ;THIS ROUTINE WILL FIGURE OUT IF YOU HAVE A DL11W
037632  005067  000020                  CLR     PROFTE
037636  012706  001000                  MOV     #BUFF,SP        ;SET UP THE STACK POINTER
037642  012767  037660  140134          MOV     #DL11W,4        ;SET UP THE TRAP VECTOR
037650  005767  137710                  TST     TPS             ;TEST THE PUNCH STATUS REGISTER
037654  000403                          BR      DL11W1
037656  000000                  PROFTE: 000000
037660  005267  177772          DL11W:  INC     PROFTE          ;INCR IF NO DL11W
037664  012767  000006  140112  DL11W1: MOV     #6,4

037672                          SKP104:
                                ;*****************************************************************************
                                ;TEST 375         TEST THAT A TTY INTERRUPT CAUSES AN OVERFLOW TRAP
                                ;*****************************************************************************
037672  005212                  TS375:  INC     (R2)            ;UPDATE TEST NUMBER
037674  022712  000375                  CMP     #375,(R2)       ;SEQUENCE ERROR?
037700  001037                          BNE     TDEC8           ;BR TO ERROR HALT ON SEQ ERROR
037702  005767  177750                  TST     PROFTE
037706  001047                          BNE     R7TRX
037710  122767  000001  140402          CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
037716  001003                          BNE     2$                      ;IF NOT, DO THIS TEST
037720  005767  140362                  TST     $PASS                   ;IS THIS THE FIRST PASS?
037724  001040                          BNE     R7TRX                   ;IF NOT FIRST PASS, SKIP TEST
037726                          2$:
037726  000005                          RESET                   ;
037730  012767  000340  140040          MOV     #340,STATUS     ;LOCK OUT INTERRUPT
037736  012706  000400                  MOV     #400,%6         ;SET UP STACK TO OVERFLOW
037742  012767  040010  140034          MOV     #TDEC77,4       ;SET UP OVERFLOW TRAP
037750  012767  040000  140106          MOV     #TDEC8,64       ;SET UP INTERRUPT VECTOR
037756  012767  000100  137600          MOV     #100,TTCSR      ;SET INTERRUPT ENABLE
```

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037764 005067 140006                  CLR     STATUS           ;ALLOW INTERRUPT TO OCCUR
037770 012742 001127                  MOV     #1127,-(R2)      ;MOVE TO MAILBOX #  *******  1127  *******
037774 005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037776 000000                         HALT                     ;NO INTERRUPT OCCURRED
040000                        TDEC8:
040000 012742 001130                  MOV     #1130,-(R2)      ;MOVE TO MAILBOX #  *******  1130  *******
040004 005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
040006 000000                         HALT                     ;OVERFLOW TRAP DID NOT OCCUR OR WRONG $TSTNM
040010 005067 137550          TDEC77: CLR     TTCSR            ;CLEAR INTERRUPT ENABLE
040014 012767 000006 137762           MOV     #6,4
040022 005067 137760                  CLR     6
040026                        R7TRX:
                              ;*************************************************************************
                              ;TEST 376        TEST THAT A PENDING INTERRUPT OCCURS BEFORE TRAP
                              ;*************************************************************************
040026 005212                 TS376:  INC     (R2)             ;UPDATE TEST NUMBER
040030 022712 000376                  CMP     #376,(R2)        ;SEQUENCE ERROR?
040034 001045                         BNE     BR71             ;BR TO ERROR HALT ON SEQ ERROR
040036 005767 177614                  TST     PROFTE
040042 001053                         BNE     NODL
040044 122767 000001 140246           CMPB    #APTENV,$ENV             ;RUNING IN APT MODE?
040052 001003                         BNE     2$                       ;IF NOT, DO THIS TEST
040054 005767 140226                  TST     $PASS                    ;IS THIS THE FIRST PASS?
040060 001044                         BNE     NODL                     ;IF NOT FIRST PASS, SKIP TEST
040062                        2$:
040062 012706 001000                  MOV     #BUFF,%6
040066 012767 000340 137702           MOV     #340,STATUS      ;SET TO A HIGH PRIORITY LEVEL
040074 012767 040140 137762           MOV     #TR0,64
040102 012767 000100 137454           MOV     #100,TTCSR       ;INTERRUPT FOR TTY PUNCH/PRINTER
040110 012767 040150 137716           MOV     #BR71,34         ;TRAP VECTOR
040116 012767 040160 137740           MOV     #TR2,64          ;TTY VECTOR
040124 012767 000340 137704           MOV     #340,36          ;IF TRAP TRAPS, MOVE 340 TO PRIORITY
040132 005067 137640                  CLR     STATUS           ;SHOULD INTERRUPT AT END OF CLR INST
040136 104400                         TRAP                     ;TTY INTERRUPT SHOULD OVERRIDE TRAP
040140                        TR0:
040140 012742 001131                  MOV     #1131,-(R2)      ;MOVE TO MAILBOX #  *******  1131  *******
040144 005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
040146 000000                         HALT                     ;TTY SHOULDN'T HAVE INTERRUPTED
040150                        BR71:
040150 012742 001132                  MOV     #1132,-(R2)      ;MOVE TO MAILBOX #  *******  1132  *******
040154 005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
040156 000000                         HALT                     ;TRAP OCCURRED FIRST,OR WRONG $TSTNM
040160 005067 137652          TR2:    CLR     36
040164 042767 000100 137372           BIC     #100,TTCSR
040172                        NODL:
                              ;*************************************************************************
                              ;TEST 377        TEST THAT A PENDING INTERRUPT, INTERRUPTS BETWEEN TRAPS
                              ;*************************************************************************
040172 005212                 TS377:  INC     (R2)             ;UPDATE TEST NUMBER
040174 022712 000377                  CMP     #377,(R2)        ;SEQUENCE ERROR?
040200 001043                         BNE     TR5              ;BR TO ERROR HALT ON SEQ ERROR
040202 005767 177450                  TST     PROFTE
040206 001063                         BNE     NODL1
040210 122767 000001 140102           CMPB    #APTENV,$ENV             ;RUNING IN APT MODE?
040216 001003                         BNE     2$                       ;IF NOT, DO THIS TEST
040220 005767 140062                  TST     $PASS                    ;IS THIS THE FIRST PASS?
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040224  001054                          BNE     NODL1                   ;IF NOT FIRST PASS, SKIP TEST
040226                          2$:
040226  012706  001000                  MOV     #BUFF,%6
040232  012767  000340  137536          MOV     #340,STATUS
040240  012767  000100  137316          MOV     #100,TTCSR
040246  012767  040306  137560          MOV     #TR3,34         ;TRAP
040254  012767  040320  137602          MOV     #TR4,64         ;TTY OUTPUT
040262  012767  000340  137576          MOV     #340,66         ;TTY OUTPUT PRIORITY
040270  012767  040310  137522          MOV     #TR5,20         ;IOT
040276  012767  000340  137516          MOV     #340,22         ;IOT PRIORITY
040304  104400                          TRAP                    ;THE ACT OF TRAPPING LOWER PRIORITY
040306  000004                  TR3:    IOT                     ;INTERRUPT SHOULD OCCUR IN PLACE OF IOT TRAP
040310                          TR5:
040310  012742  001133                  MOV     #1133,-(R2)     ;MOVE TO MAILBOX #  *******  1133  *******
040314  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040316  000000                          HALT                    ;NO INTERRUPT BETWEEN TRAPS,OR WRONG $TSTNM
040320  005067  137476          TR4:    CLR     22              ;CLR IOT PRIORITY
040324  005067  137536                  CLR     66
040330  012767  000036  137476          MOV     #36,34
040336  012767  000066  137520          MOV     #66,64
040344  012767  000022  137446          MOV     #22,20
040352  005067  137206                  CLR     TTCSR
040356                          NODL1:

                                ;*************************************************************************
                                ;TEST 400       TEST THAT ''RESET'' GOES TO OUTSIDE WORLD
                                ;*************************************************************************
040356  005212                  TS400:  INC     (R2)            ;UPDATE TEST NUMBER
040360  022712  000400                  CMP     #400,(R2)       ;SEQUENCE ERROR?
040364  001021                          BNE     TS401-10        ;BR TO ERROR HALT ON SEQ ERROR
040366  005767  177264                  TST     PROFTE
040372  001022                          BNE     NODL2
040374  016700  137162                  MOV     TKB,R0          ;MAKE SURE RECEIVER DONE IS SET
040400  012767  000100  137152          MOV     #100,TRCSR      ;SET INTERRUPT ENABLE
040406  000005                          RESET                   ;SHOULD CLEAR INTERRUPT ENABLE
040410  032767  000100  137142          BIT     #100,TRCSR      ;TEST FOR CLEAR
040416  001410                          BEQ     TS401
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 762           <====
040420  012742  001134                  MOV     #1134,-(R2)     ;MOVE TO MAILBOX #  *******  1134  *******
040424  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040426  000000                          HALT                    ;RESET FAILED TO CLEAR TRCSR
                                                                ;  OR SEQUENCE ERROR
040430  012742  001135                  MOV     #1135,-(R2)     ;MOVE TO MAILBOX #  *******  1135  *******
040434  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040436  000000                          HALT                    ; WRONG $TSTNM
040440                          NODL2:
                                ;*************************************************************************
                                ;TEST 401       TEST THAT RESET HAS NO EFFECT ON THE TRACE TRAP
                                ;*************************************************************************
040440  005212                  TS401:  INC     (R2)            ;UPDATE TEST NUMBER
040442  022712  000401                  CMP     #401,(R2)       ;SEQUENCE ERROR?
040446  001014                          BNE     RESET3          ;BR TO ERROR HALT ON SEQ ERROR
040450  012706  001000                  MOV     #BUFF,%6        ;SET STACK
```

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040454  012767  040510  137332            MOV     #RESET2,14          ;SET UP TRACE VECTOR
040462  012746  000020                    MOV     #20,-(R6)           ;SET THE T-BIT ON STACK
040466  012746  040474                    MOV     #1$,-(R6)           ;MOVE NEW PC ON STACK
040472  000006                            RTT
040474  000005                    1$:     RESET                       ;SHOULD HAVE NO EFFECT
040476  000005                            RESET                       ;NO EFFECT
040500                            RESET3:
040500  012742  001136                    MOV     #1136,-(R2)         ;MOVE TO MAILBOX #  *******  1136  *******
040504  005242                            INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
040506  000000                            HALT                        ;TRACE TRAP FAILED,OR WRONG $TSTNM
040510  005067  137262            RESET2: CLR     STATUS              ;CLEAR TRACK
040514  005067  137276                    CLR     16                  ;TRACE STATUS
040520  012767  000016  137266            MOV     #16,14
040526                            SKTST2:
                                  ;*******************************************************************************
                                  ;TEST 402        TEST THAT WHEN TTY INTERRUPTS IT POPS NEW STATUS
                                  ;*******************************************************************************
040526  005212                    TS402:  INC     (R2)                ;UPDATE TEST NUMBER
040530  022712  000402                    CMP     #402,(R2)           ;SEQUENCE ERROR?
040534  001057                            BNE     TTY11               ;BR TO ERROR HALT ON SEQ ERROR
040536  005767  177114                    TST     PROFTE
040542  001062                            BNE     NODL3
040544  122767  000001  137546            CMPB    #APTENV,$ENV                ;RUNING IN APT MODE?
040552  001003                            BNE     2$                          ;IF NOT, DO THIS TEST
040554  005767  137526                    TST     $PASS                       ;IS THIS THE FIRST PASS?
040560  001053                            BNE     NODL3                       ;IF NOT FIRST PASS, SKIP TEST
040562                            2$:
040562  000005                            RESET
040564  012706  001000                    MOV     #BUFF,%6            ;SET UP STACK
040570  012767  040614  137266            MOV     #TTY3,64            ;INTERRUPT VECTOR
040576  005067  137174                    CLR     STATUS              ;DROP PROCESSOR PRIORITY
040602  012767  000357  137256            MOV     #357,66             ;HIGH PRIORITY ON INTERRUPT
040610  105167  136750                    COMB    TTCSR               ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
040614  026727  137156  000357    TTY3:   CMP     STATUS,#357
040622  001404                            BEQ     1$
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                      ;           CONDITIONAL BRANCH INST. AND   <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                      ;           WHICH FOLLOWS W/ 744           <====
040624  012742  001137                    MOV     #1137,-(R2)         ;MOVE TO MAILBOX #  *******  1137  *******
040630  005242                            INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
040632  000000                            HALT                        ;INTERRUPT DID NOT POP CORRECT STATUS
040634  000005                    1$:     RESET                       ;CLR NTERRUPT ENABLE
040636  012706  001000                    MOV     #BUFF,%6            ;STACK SET UP
040642  012767  040666  137214            MOV     #TTY4,64            ;INTERRUPT VECTOR
040650  005067  137212                    CLR     66                  ;CLR NEW STATUS
040654  012767  000157  137114            MOV     #157,STATUS         ;PROCESSOR STATUS
040662  105167  136676                    COMB    TTCSR               ;SET INTERRUPT ENABLE
040666  005767  137104            TTY4:   TST     STATUS
040672  001404                            BEQ     TTT37
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                      ;           CONDITIONAL BRANCH INST. AND   <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                      ;           WHICH FOLLOWS W/ 720           <====
040674                            TTY11:
040674  012742  001140                    MOV     #1140,-(R2)         ;MOVE TO MAILBOX #  *******  1140  *******
```

```
040700  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
040702  000000                           HALT                      ;INCORRECT STATUS,OR WRONG $TSTNM
040704  105167  136654           TTT37:  COMB    TTCSR
040710                           NODL3:


                                 ;*******************************************************************************
                                 ;TEST 403          TEST THE 'WAIT' INSTRUCTION
                                 ;*******************************************************************************
040710  005212                   TS403:  INC     (R2)              ;UPDATE TEST NUMBER
040712  022712  000403                   CMP     #403,(R2)         ;SEQUENCE ERROR?
040716  001062                           BNE     STP4              ;BR TO ERROR HALT ON SEQ ERROR
040720  122767  000001  137372           CMPB    #APTENV,$ENV                ;RUNING IN APT MODE?
040726  001003                           BNE     1$                          ;IF NOT, DO THIS TEST
040730  005767  137352                   TST     $PASS                       ;IS THIS THE FIRST PASS?
040734  001057                           BNE     STP4E                       ;IF NOT FIRST PASS, SKIP TEST
040736                           1$:
040736  042767  000100  136620           BIC     #100,TPS          ;CLEAR INTERRUPT ENABLE
040744  012706  001000                   MOV     #BUFF,SP          ;SET UP THE STACK
040750  012767  041036  137106           MOV     #WATE,64          ;SET UP THE INTERRUPT VECTOR
040756  005067  137104                   CLR     66
040762  105767  136576           WATE1:  TSTB    TPS               ;WAIT FOR READY
040766  100375                           BPL     WATE1             ;TO BE UP
040770  012767  000015  136570           MOV     #15,TPB           ;DO A CARRIAGE RETURN
040776  105767  136562           WATE2:  TSTB    TPS               ;WAIT FOR READY TO COME UP
041002  100375                           BPL     WATE2
041004  012767  000015  136554           MOV     #15,TPB           ;DO ANOTHER CARRIAGE RETURN
041012  052767  000100  136544           BIS     #100,TPS          ;SET THE INTERRUPT ENABLE
041020  005067  136752                   CLR     STATUS            ;CLEAR THE PSW
041024  000001                   WATE3:  WAIT                      ;WAIT FOR THE INTERRUPT
041026  012742  001141                   MOV     #1141,-(R2)       ;MOVE TO MAILBOX #  *******  1141  *******
041032  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041034  000000                           HALT                      ;WAIT INSTRUCTION DID NOT LOOP
041036  005767  136734           WATE:   TST     STATUS  ;IS THE PSW CORRECT?
041042  001404                           BEQ     1$
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 725            <====
041044  012742  001142                   MOV     #1142,-(R2)       ;MOVE TO MAILBOX #  *******  1142  *******
041050  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041052  000000                           HALT                      ;NEW PSW SHOULD HAVE BEEN ZERO
041054  026727  137714  041026   1$:     CMP     BUFF-4,#WATE3+2   ;IS THE OLD PC SAVED
041062  001404                           BEQ     STP4E
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 715            <====
041064                           STP4:
041064  012742  001143                   MOV     #1143,-(R2)       ;MOVE TO MAILBOX #  *******  1143  *******
041070  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041072  000000                           HALT                      ;OLD PC WAS NOT SAVED OR WRONG $TESTN
041074                           STP4E:
                                 ;*******************************************************************************
                                 ;TEST 404          TEST THAT USING REGISTER ADDR (177700) CAUSES TIME OUT.
                                 ;*******************************************************************************
041074  005212                   TS404:  INC     (R2)              ;UPDATE TEST NUMBER
```

```
041076  022712  000404                  CMP     #404,(R2)           ;SEQUENCE ERROR?
041102  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.
                                        ;
041104  012706  001000                  MOV      #BUFF,SP           ;SET  STACK POINTER
041110  012737  041132  000004          MOV      #RETR1,@#RTRAP5;SET TRAP RETURN ADDR
041116  005737  177700          PCN1:   TST      @#177700           ;BAD ADDR REFERENCE, TRAP TO 4
041122  012742  001144                  MOV     #1144,-(R2)         ;MOVE TO MAILBOX #  *******  1144  *******
041126  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
041130  000000                          HALT                        ;REFERENCING 177700 DID NOT CAUSE TIME OUT
041132  022767  041122  137634  RETR1:  CMP     #PCN1+4,BUFF-4      ;PROPER PC STORED ON STACK?
041140  001404                          BEQ     TS405
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 760            <====
041142  012742  001145                  MOV     #1145,-(R2)         ;MOVE TO MAILBOX #  *******  1145  *******
041146  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
041150  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.
                                ;*****************************************************************************
041152  005212                  TS405:  INC     (R2)                ;UPDATE TEST NUMBER
041154  022712  000405                  CMP     #405,(R2)           ;SEQUENCE ERROR?
041160  001013                          BNE     TS406-10            ;BR TO ERROR HALT ON SEQ ERROR
                                ;
041162  012737  041210  000004          MOV     #RETR2,@#RTRAP5 ;SET TRAP RETURN ADDR
041170  005037  000000                  CLR     @#0                 ;PUT ALL 0 IN LOC 0
041174  005337  000001                  DEC     @#1                 ;DECREMENT ODD ADDRESS, SHOULD NOT TRAP
041200  022737  177777  000000          CMP     #-1,@#0             ;WORD LOC 0 HAS ALL ONES?
041206  001404                          BEQ     TS406
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 764            <====
041210                          RETR2:
041210  012742  001146                  MOV     #1146,-(R2)         ;MOVE TO MAILBOX #  *******  1146  *******
041214  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
041216  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.
                                ;*****************************************************************************
```

```
041220  005212                          TS406:  INC     (R2)            ;UPDATE TEST NUMBER
041222  022712  000406                          CMP     #406,(R2)       ;SEQUENCE ERROR?
041226  001016                                  BNE     TS407-10        ;BR TO ERROR HALT ON SEQ ERROR
041230  012737  041256  000004                  MOV     #RETR3,@#RTRAP5 ;SET TRAP RETURN ADDR
041236  012700  177700                          MOV     #177700,R0      ;STORES BAD MEMORY REFERENCE
041242  012720  001234                          MOV     #1234,(R0)+     ;BAD ADDR REFERENCE, TRAP TO LOC 4
041246  012742  001147                          MOV     #1147,-(R2)     ;MOVE TO MAILBOX #  *******  1147  *******
041252  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041254  000000                                  HALT                    ;ADDRESSING 177700 DID NOT CAUSE TRAP
041256  022700  177702                  RETR3:  CMP     #177702,R0      ;WAS R0 INCREMENTED?
041262  001404                                  BEQ     TS407
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 761            <====
041264  012742  001150                          MOV     #1150,-(R2)     ;MOVE TO MAILBOX #  *******  1150  *******
041270  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041272  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.
                                        ;***************************************************************************************
041274  005212                          TS407:  INC     (R2)            ;UPDATE TEST NUMBER
041276  022712  000407                          CMP     #407,(R2)       ;SEQUENCE ERROR?
041302  001054                                  BNE     TS410-10        ;BR TO ERROR HALT ON SEQ ERROR
041304  012737  041362  000004                  MOV     #DBE1,@#RTRAP5  ;SET TRAP RETURN ADDR
041312  012737  000340  000006                  MOV     #340,@#6        ;SET UP PS
041320  012737  041352  000010                  MOV     #DBE2,@#RTRAP   ;SET TRAP RETURN ADDR
041326  012737  000340  000012                  MOV     #340,@#12       ;SET UP PS
041334  012706  177700                          MOV     #177700,SP      ;SET ILLEGAL SP
041340  000077                          DBE:    TRAPA                   ;ILLEGAL INSTRUCTION
041342  012742  001151                          MOV     #1151,-(R2)     ;MOVE TO MAILBOX #  *******  1151  *******
041346  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041350  000000                                  HALT                    ;DOUBLE BUS ERROR DID NOT CAUSE TRAP
041352                                  DBE2:
041352  012742  001152                          MOV     #1152,-(R2)     ;MOVE TO MAILBOX #  *******  1152  *******
041356  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041360  000000                                  HALT                    ;TRAP TO WRONG LOCATION
041362  022737  041342  000000          DBE1:   CMP     #DBE+2,@#0      ;OLD PC GOT SAVED?
041370  001404                                  BEQ     DBE3
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
041372  012742  001153                          MOV     #1153,-(R2)     ;MOVE TO MAILBOX #  *******  1153  *******
041376  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041400  000000                                  HALT                    ;OLD PC DID NOT GET SAVEDD
```

```
041402  022737  000340  000002  DBE3:   CMP     #340,@#2        ;CORRECT PS SAVED?
041410  001404                          BEQ     DBE4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 734             <====
041412  012742  001154                  MOV     #1154,-(R2)     ;MOVE TO MAILBOX #  *******  1154  *******
041416  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041420  000000                          HALT                    ;CORRECT PS DID NOT GET SAVE
041422  022706  000000          DBE4:   CMP     #0,SP           ;SP POINTS TO LOC 0?
041426  001404                          BEQ     DBE5
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 725             <====
041430  012742  001155                  MOV     #1155,-(R2)     ;MOVE TO MAILBOX #  *******  1155  *******
041434  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041436  000000                          HALT                    ;SP IS NOT POINTING TO LOC 0
041440  012706  001000          DBE5:   MOV     #STBOT,SP       ;RESET SP


                                ;*******************************************************************************
                                ;TEST 410       TEST MFPT
                                ;*******************************************************************************
041444  005212                  TS410:  INC     (R2)            ;UPDATE TEST NUMBER
041446  022712  000410                  CMP     #410,(R2)       ;SEQUENCE ERROR?
041452  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
041454  012706  001000                  MOV     #STBOT,R6       ;INIT. SP
041460  013746  000010                  MOV     @#10,-(SP)      ;SAVE TRAP VECTOR
041464  012737  041514  000010          MOV     #1$,@#10        ;SET UP ILLEGAL INSTRUCTION TRAP
041472  010046                          MOV     R0,-(SP)        ;SAVE R0
041474  000007                          MFPT                    ;GET PROCESSOR MODEL
041476  010037  041524                  MOV     R0,@#CPUTYP     ;STORE IT
041502  012600                          MOV     (SP)+,R0        ;RESTORE R0
041504  022737  000003  041524          CMP     #3,@#CPUTYP     ;CHECK MODEL TYPE
041512  001405                          BEQ     XXT
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 757             <====
041514                          1$:
041514  012742  001156                  MOV     #1156,-(R2)     ;MOVE TO MAILBOX #  *******  1156  *******
041520  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041522  000000                          HALT                    ;ILLEGAL INSTR TRAP OR WRONG MODEL TYPE

041524  000000                  CPUTYP: .WORD   0
041526                          XXT:
041526  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.  ON THE KDF11-A, THIS INCLUDES: FIS(CTL3), CIS AND WCS
```

```
                                          ;INSTRUCTIONS.  A CTLERR TRAPS TO LOCATION 10.
                                          ;THE RESET LINE IS ALSO ASSERTED FOR 1 CYCLE.
                                          ;*************************************************************************
                                          ;TEST 411        TEST CTLERR SERVICE ROUTINE
                                          ;*************************************************************************
041532  005212                            TS411:  INC     (R2)              ;UPDATE TEST NUMBER
041534  022712  000411                            CMP     #411,(R2)         ;SEQUENCE ERROR?
041540  001022                                    BNE     TS412-10          ;BR TO ERROR HALT ON SEQ ERROR
041542  012706  001000                            MOV     #STBOT,R6         ;INIT STACK POINTER
041546  012737  041566  000010                    MOV     #1$,@#10                  ;SET UP RETURN ADDR FROM TRAP
041554  012737  000340  000012                    MOV     #340,@#12         ;SET TRAP PRIORITY=7
041562  075006                                    FADD    R6                ;EXECUTE FIS INSTR..SHOULD CAUSE CTLERR
041564  000000                                    HALT                      ;DID NOT TRAP..CHECK CSEL LINE
041566  012737  041600  000010    1$:             MOV     #2$,@#10                  ;SET UP RETURN ADDR FROM TRAP
041574  076000                                    76000                     ;EXECUTE CIS INSTR..SHOULD TRAP
041576  000000                                    HALT                      ;DID NOT TRAP
041600  012737  041612  000010    2$:             MOV     #3$,@#10                  ;SET UP RETURN ADDR FROM TRAP
041606  076700                                    76700                     ;EXECUTE WCS INSTR..SHOULD CAUSE CTLERR AND TRAP
041610  000000                                    HALT                      ;DID NOT TRAP
041612  012706  001000            3$:             MOV     #STBOT,R6         ;RE-INIT STACK POINTER
                                          ;*************************************************************************
                                          ;TEST 412        TEST THAT ALL RESERVED INSTRUCTIONS TRAP
                                          ;*************************************************************************
041616  005212                            TS412:  INC     (R2)              ;UPDATE TEST NUMBER
041620  022712  000412                            CMP     #412,(R2)         ;SEQUENCE ERROR?
041624  001112                                    BNE     RET4              ;BR TO ERROR HALT ON SEQ ERROR
041626  042767  000100  135730                    BIC     #100,TPS
041634  012737  041662  000244                    MOV     #TRAP244,@#244    ; SET UP TO SEE IF
041642  013767  000010  000024                    MOV     @#10,TENSAVE      ;  THIS PROCESSOR HAS THE
041650  012737  041672  000010                    MOV     #TRAP10,@#10      ;  FLOATING POINT OPTION
041656  170007                                    .WORD   170007            ; AN ILLEGAL FPP INSTRUCTION
041660  000406                                    BR      AROUND            ; THE FOLLOWING
041662                                    TRAP244:                          ; IF FPP IN--
041662  013767  042114  000234                    MOV     @#FPP,FINISH      ;  RESET END OF TABLE POINTER
041670  000002                                    RTI                       ; AND RETURN
041672                                    TRAP10:                           ; LEAVE THE TABLE ALONE
041672  000002                                    RTI                       ; AND RETURN
041674  000000                            TENSAVE:.WORD   0                 ; A PLACE TO STORE CONTENTS OF 10
041676                                    AROUND:                           ;  CONTINUATION POINT
041676  012737  000246  000244                    MOV     #246,@#244        ;  RESTORE THE TRAP VECTOR
041704  016737  177764  000010                    MOV     TENSAVE,@#10      ; RESTORE THE ILLEGAL INST. VECTOR
041712  012703  042074                            MOV     #TABLE,TAB        ;TABLE POINTER
041716  012305                            GIN1:   MOV     (TAB)+,FIRST      ;FIRST OR CURRENT INSTRUCTION
041720  012301                                    MOV     (TAB)+,LAST       ;LAST INSTRUCTION OR GROUP
041722  020567  000176                            CMP     FIRST,FINISH      ;TESTED ALL
041726  001415                                    BEQ     GIN3              ;YES BRANCH
041730  010567  000172                            MOV     FIRST,INST        ;SET UP INST
041734  005267  000166                    GIN2:   INC     INST
041740  012767  042006  136042                    MOV     #RET,10           ;SET UP RETURN FROM TRAP
041746  012706  001000                            MOV     #BUFF,SP          ;SET UP STACK POINTER
041752  005067  136020                            CLR     CC                ;CLEAR PRIORITY
041756  000167  000144                            JMP     INST              ;EXECUTE RESERVED INSTRUCTION
041762  012737  062234  000034    GIN3:           MOV     #$TRAP,@#34       ;TRAP VECTOR FOR TRAP CALL
```

```
041770  012737  000340  000036          MOV     #340,@#36       ;LEVEL 7
041776  012700  000370                  MOV     #370,R0         ;RESET RESERVED AREA 370-402
042002  000167  000234                  JMP     THRPRT          ;JUMP TO EIS TEST

                                ;TRAPPING SHOULD SEND YOU HERE
042006  020627  000774          RET:    CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
042012  001404                          BEQ     RET1
042014  012742  001157                  MOV     #1157,-(R2)     ;MOVE TO MAILBOX #  *******  1157  *******
042020  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042022  000000                          HALT                    ;WRONG DECREMENT
042024  026727  136744  042130  RET1:   CMP     BUFF-4,#INST+2  ;LOC OF INST UNINCREMENTED
042032  001404                          BEQ     RET2
042034  012742  001160                  MOV     #1160,-(R2)     ;MOVE TO MAILBOX #  *******  1160  *******
042040  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042042  000000                          HALT                    ;INST INC ON TRAP
042044  005767  136726          RET2:   TST     BUFF-2
042050  001404                          BEQ     RET3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 665            <====
042052                          RET4:
042052  012742  001161                  MOV     #1161,-(R2)     ;MOVE TO MAILBOX #  *******  1161  *******
042056  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042060  000000                          HALT                    ;CONDITION CODES SET ON TRAP OR WRONG $TSTNM
042062  026701  000040          RET3:   CMP     INST,LAST
042066  001713                          BEQ     GIN1            ;SET UP NEW GROUP
042070  000167  177640                  JMP     GIN2            ;FINISH OLD GROUP
                                                                ;END OF INSTRUCTION GROUP
042074  000007                  TABLE:  7                       ;END OF OPERATE
042076  000077                          77
042100  000207                          207                     ;RTS,RT1,JMP
042102  000227                          227
042104  006777                          6777
042106  007777                          7777
042110  075037                          075037
042112  076777                          76777
042114  167777                  FPP:    167777                  ;  START OF THE FPP INSTRUCTIONS
042116  177700                          177700
042120  177716                          177716
042122  177777                          177777
042124  042124                  FINISH: .                       ;END FLAG
042126  000000                  INST:   HALT                    ;WILL CONTINUE RESERVED INST
042130  000000                          HALT                    ;SHOULD TRAP TO LOC 10
042132  000000                          HALT                    ;LOC 10 SHOULD SEND YOU TO
042134  000000                          HALT                    ;RET
042136  000000                          HALT
                                .SBTTL  ** STARTING OF EIS TEST **
        000000                  .REPT   0


                                .PAGE

                                        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


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

```
         000000                    DUMMY=  0
         000001                    ERRNM=  1
         000051                    F=      51
         000176                    N=      176
         001000                    SW09=   1000
         002000                    SW10=   2000
         004000                    SW11=   4000
         010000                    SW12=   10000

042140                             COUNT:
         042142                            .=COUNT+2
042142                             PSWORD:
         042144                            .=PSWORD+2
042144                             TEMP1:
         042146                            .=TEMP1+2
042146                             TEMP2:
         042150                            .=TEMP2+2
042150                             TEMP3:
         042152                            .=TEMP3+2
042152                             TEMP4:
         042154                            .=TEMP4+2
042154   000000                    TEMP5:  .WORD
042156   000000                    TEMP6:  .WORD
042160      000                    TYPCNT: .BYTE
042161      000                    $TPCNT: .BYTE
042162   000007                    S0:     7
042164   177771                    S1:     -7
042166   042164                    S2:     S1
042170   177772                    S3:     -6
042172   177777                    S4:     -1
042174   040000                    S5:     40000
042176   042174                    S6:     S5
042200   040000                    S7:     40000
042202   177776                    S8:     -2
042204   000002                    S9:     2
042206   042204                    S10:    S9
042210   000002                    S11:    2
042212   177570                    SWR:    177570
042214   177570                    DISPLAY:        177570
042216   000064                    TTYOUT: 64
042220   177566                    $TPB:   177566
042222   177564                    $TPS:   177564
042224   005015  020040  000040    $CRLF:  .ASCIZ  <15><12>/   /
042232   006412  047520  042527    POWER:  .ASCIZ  <12><15>/POWER/
042240   000122
```

11553

```
042242                                  THRPRT:
042242  012705  000304                          MOV     #$TESTN,R5      ;MAKE R5 POINT TO THE LOCATION $TESTN
042246  005037  042140                          CLR     @#COUNT         ;CLEAR THE COUNTER
042252  012715  000001                          MOV     #1,(R5)         ;INITIALIZE TEST NUMBER
042256  012706  001000                          MOV     #STBOT,SP       ;** STACK AT STBOT **
042262  013746  000004                          MOV     @#4,-(SP)       ;SAVE ERROR VECTOR
042266  013746  000006                          MOV     @#6,-(SP)       ;
042272  012767  042306  135504                  MOV     #1$,4           ;SET UP TIMEOUT VECTOR
042300  005777  177706                          TST     @SWR            ;TRY TO REFERENCE HARDWRE SWR
042304  000407                                  BR      3$              ;BRANCH IF NO TIMEOUT TRAP OCCURS
042306  012767  000176  177676  1$:             MOV     #SWREG,SWR      ;POINT TO SOFTWARE SWR
042314  012767  000174  177672                  MOV     #DISPREG,DISPLAY        ;POINT TO SOFTWARE DISPLAY REG
042322  022626                                  CMP     (SP)+,(SP)+     ;RESTORE STACK
042324  012637  000006          3$:             MOV     (SP)+,@#6       ;RESTORE ERROR VECTOR
042330  012637  000004                          MOV     (SP)+,@#4       ;
042334  106427  000000                          MTPS    #0              ;PLACE #0 IN PSW
042340  132737  000001  000320                  BITB    #1,@#$ENV       ;ARE WE UNDER APT ?
042346  001403                                  BEQ     2$              ;IF NOT THEN GO TO 2$
042350  012767  000322  177634                  MOV     #$SWREG,SWR     ;USE APT SWITCH REGISTER
042356  012737  000001  042144  2$:             MOV     #1,@#TEMP1      ;TEMP1=1
042364  005037  042146                          CLR     @#TEMP2         ;TEMP2=0
042370  012737  000001  042150                  MOV     #1,@#TEMP3      ;TEMP3=1
042376  005037  042152                          CLR     @#TEMP4         ;TEMP4=0
```

```


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




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


042402  010767  135564              ASTART: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
042406  013700  042144                      MOV     @#TEMP1,%0         ;LOAD R0 WITH THE CONTENTS OF TEMP1
042412  032737  000001  000306              BIT     #1,@#$PASS         ;IS IT AN EVEN PASS ?
042420  001004                              BNE     2$                 ;IF NOT THEN GO TO 2$
042422  013701  042146                      MOV     @#TEMP2,R1         ;OTHERWISE EXECUTE THE INSTRUCTION
                                                                       ;IN MODE 0 USING R1
042426  072001                              ASH     R1,R0
042430  000402                              BR      4$
042432  072067  177510              2$:     ASH     TEMP2,%0           ;SHIFT R0 BY THE NUMBER SPECIFIED BY TEMP2
042436  106737  042142              4$:     MFPS    @#PSWORD           ;SAVE PS
042442  123737  042152  042142              CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
042450  001403                              BEQ     .+10
042452  004767  016050                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;THE PS IS NOT EQUAL TO 0
042456  000001                              1                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)

042460  005237  042140                      INC     @#COUNT            ;INCREMENT THE COUNTER
042464  023700  042150                      CMP     @#TEMP3,%0         ;IS THE RESULT IN R0 EQUAL TO TEMP3?
042470  001403                              BEQ     .+10
042472                              6$:
042472  004767  016030                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;EITHER INCORRECT R0 OR INCORRECT SEQUENCE
042476  000002                              2                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)

042500  021537  042140                      CMP     (R5),@#COUNT       ;IS THE TEST NUMBER EQUAL TO THE
                                                                       ;COUNTER?
042504  001372                              BNE     6$                 ;IF NOT GO TO THE HLT ABOVE
042506  005215                              INC     (R5)
042510  010767  135456                      MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
042514  021527  000037                      CMP     (R5),#37           ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                       ;BY 14. AND RIGHT BY 14.?
042520  002011                              BGE     8$
042522  005237  042146                      INC     @#TEMP2
042526  006367  177416                      ASL     TEMP3              ;SHIFT TEMP3 LEFT.
042532  021527  000020                      CMP     (R5),#20           ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
042536  001004                              BNE     REGR1
042540  000167  001010                      JMP     NEGAT              ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
042544  004767  001032              8$:     JSR     PC,TST37           ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
042550  010767  135416              REGR1:  MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
042554  013701  042144                      MOV     @#TEMP1,%1         ;LOAD R1 WITH THE CONTENTS OF TEMP1
042560  032737  000001  000306              BIT     #1,@#$PASS         ;IS IT AN EVEN PASS ?
```

```
042566 001004                          BNE     2$                  ;IF NOT THEN GO TO 2$
042570 013702 042146                   MOV     @#TEMP2,R2          ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
042574 072102                          ASH     R2,R1               ;USING R1
042576 000402                          BR      4$
042600 072167 177342            2$:    ASH     TEMP2,%1            ;SHIFT R1 BY THE NUMBER SPECIFIED BY TEMP2
042604 106737 042142            4$:    MFPS    @#PSWORD            ;SAVE PS
042610 123737 042152 042142            CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
042616 001403                          BEQ     .+10
042620 004767 015702                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                   ;THE PS IS NOT EQUAL TO 0
042624 000003                          3                   ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

042626 005237 042140                   INC     @#COUNT             ;INCREMENT THE COUNTER
042632 023701 042150                   CMP     @#TEMP3,%1          ;IS THE RESULT IN R1 EQUAL TO TEMP3?
042636 001403                          BEQ     .+10
042640                          6$:
042640 004767 015662                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                   ;EITHER INCORRECT R1 OR INCORRECT SEQUENCE
042644 000004                          4                   ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

042646 021537 042140                   CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
042652 001372                          BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
042654 005215                          INC     (R5)
042656 010767 135310                   MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
042662 021527 000037                   CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                   ;BY 14. AND RIGHT BY 14.?
042666 002011                          BGE     8$
042670 005237 042146                   INC     @#TEMP2
042674 006367 177250                   ASL     TEMP3               ;SHIFT TEMP3 LEFT
042700 021527 000020                   CMP     (R5),#20            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
042704 001004                          BNE     REGR2
042706 000167 000642                   JMP     NEGAT               ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
042712 004767 000664            8$:    JSR     PC,TST37            ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
042716 010767 135250            REGR2: MOV     PC,LPADR            ;STORE ERROR LOOP ADDPESS
042722 013702 042144                   MOV     @#TEMP1,%2          ;LOAD R2 WITH THE CONTENTS OF TEMP1
042726 032737 000001 000306            BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
042734 001004                          BNE     2$                  ;IF NOT THEN GO TO 2$
042736 013703 042146                   MOV     @#TEMP2,R3          ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
042742 072203                          ASH     R3,R2               ;USING R2
042744 000402                          BR      4$
042746 072267 177174            2$:    ASH     TEMP2,%2            ;SHIFT R2 BY THE NUMBER SPECIFIED BY TEMP2
042752 106737 042142            4$:    MFPS    @#PSWORD            ;SAVE PS
042756 123737 042152 042142            CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
042764 001403                          BEQ     .+10
042766 004767 015534                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                   ;THE PS IS NOT EQUAL TO 0
042772 000005                          5                   ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

042774 005237 042140                   INC     @#COUNT
043000 023702 042150                   CMP     @#TEMP3,%2          ;IS THE RESULT IN R2 EQUAL TO TEMP3?
043004 001403                          BEQ     .+10
043006                          6$:
043006 004767 015514                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

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                                                                            ;EITHER INCORRECT R2 OR INCORRECT SEQUENCE
043012  000006                          6                        ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

043014  021537  042140                  CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043020  001372                          BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
043022  005215                          INC     (R5)
043024  010767  135142                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043030  021527  000037                  CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                    ;LEFT BY 14, AND RIGHT BY 14.?
043034  002011                          BGE     8$
043036  005237  042146                  INC     @#TEMP2
043042  006367  177102                  ASL     TEMP3               ;SHIFTED TEMP3 LEFT
043046  021527  000020                  CMP     (R5),#20            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043052  001004                          BNE     REGR3
043054  000167  000474                  JMP     NEGAT               ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043060  004767  000516          8$:     JSR     PC,TST37            ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043064  010767  135102          REGR3:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043070  013703  042144                  MOV     @#TEMP1,%3          ;LOAD R3 WITH THE CONTENTS OF TEMP1
043074  032737  000001  000306          BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
043102  001004                          BNE     2$                  ;IF NOT THEN GO TO 2$
043104  013704  042146                  MOV     @#TEMP2,R4          ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043110  072304                          ASH     R4,R3               ;USING R3
043112  000402                          BR      4$
043114  072367  177026          2$:     ASH     TEMP2,%3            ;SHIFT R3 BY THE NUMBER SPECIFIED BY TEMP2
043120  106737  042142          4$:     MFPS    @#PSWORD            ;SAVE PS
043124  123737  042152  042142          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
043132  001403                          BEQ     .+10
043134  004767  015366                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;THE PS IS NOT EQUAL TO 0.
043140  000007                          7                        ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

043142  005237  042140                  INC     @#COUNT
043146  023703  042150                  CMP     @#TEMP3,%3          ;IS THE RESULT IN R3 EQUAL TO TEMP3?
043152  001403                          BEQ     .+10
043154                          6$:
043154  004767  015346                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;EITHER INCORRECT R3 OR INCORRECT SEQUENCE
043160  000010                          10                       ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

043162  021537  042140                  CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043166  001372                          BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
043170  005215                          INC     (R5)
043172  010767  134774                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043176  021527  000037                  CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                    ;LEFT BY 14, AND RIGHT BY 14.?
043202  002010                          BGE     8$
043204  005237  042146                  INC     @#TEMP2
043210  006367  176734                  ASL     TEMP3               ;SHIFT TEMP3 LEFT?
043214  021527  000020                  CMP     (R5),#20            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043220  001003                          BNE     REGR4
043222  000554                          BR      NEGAT               ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043224  004767  000352          8$:     JSR     PC,TST37            ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043230  010767  134736          REGR4:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
```

```
043234  013704  042144                   MOV     @#TEMP1,%4          ;LOAD R4 WITH THE CONTENTS OF TEMP1
043240  010501                           MOV     R5,R1               ;SAVE R5
043242  032737  000001  000306           BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
043250  001004                           BNE     2$                  ;IF NOT THEN GO TO 2$
043252  013705  042146                   MOV     @#TEMP2,R5          ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043256  072405                           ASH     R5,R4               ;USING R4
043260  000402                           BR      4$
043262  072467  176660           2$:     ASH     TEMP2,%4            ;SHIFT R4 BY THE NUMBER SPECIFIED BY TEMP2
043266  106737  042142           4$:     MFPS    @#PSWORD            ;SAVE PS
043272  123737  042152  042142           CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
043300  001403                           BEQ     .+10
043302  004767  015220                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;THE PS IS NOT EQUAL TO 0
043306  000011                           11              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                         ;BY  (013746  000172  000207)

043310  005237  042140                   INC     @#COUNT
043314  023704  042150                   CMP     @#TEMP3,%4          ;IS THE RESULT IN R4 EQUAL TO TEMP3?
043320  001403                           BEQ     .+10
043322                           6$:
043322  004767  015200                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;EITHER INCORRECT R4 OR INCORRECT SEQUENCE
043326  000012                           12              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                         ;BY  (013746  000172  000207)

043330  010105                           MOV     R1,R5               ;RESTORE R5
043332  021537  042140                   CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043336  001371                           BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
043340  005215                           INC     (R5)
043342  010767  134624                   MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043346  021527  000037                   CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN
                                                                     ;SHIFTED LEFT BY 14. AND RIGHT BY 14.?
043352  002010                           BGE     8$
043354  005237  042146                   INC     @#TEMP2
043360  006367  176564                   ASL     TEMP3               ;SHIFT TEMP3 LEFT
043364  021527  000020                   CMP     (R5),#20            ;HAS THE CONTENTS OF REGISTER BEEN SHIFTED BY 14.?
043370  001003                           BNE     REGR5
043372  000470                           BR      NEGAT               ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043374  004767  000202           8$:     JSR     PC,TST37            ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043400  010767  134566           REGR5:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043404  010501                           MOV     R5,R1               ;SAVE R5
043406  013705  042144                   MOV     @#TEMP1,%5          ;LOAD R5 WITH THE CONTENTS OF TEMP1
043412  032737  000001  000306           BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
043420  001004                           BNE     2$                  ;IF NOT THEN GO TO 2$
043422  013700  042146                   MOV     @#TEMP2,R0          ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043426  072500                           ASH     R0,R5               ;USING R5
043430  000402                           BR      4$
043432  072567  176510           2$:     ASH     TEMP2,%5            ;SHIFT R5 BY THE NUMBER SPECIFIED BY TEMP2
043436  106737  042142           4$:     MFPS    @#PSWORD            ;SAVE PS
043442  123737  042152  042142           CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
043450  001403                           BEQ     .+10
043452  004767  015050                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;THE PS IS NOT EQUAL TO 0.
043456  000013                           13              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                         ;BY  (013746  000172  000207)
```

```
043460  005237  042140                    INC     @#COUNT
043464  023705  042150                    CMP     @#TEMP3,%5       ;IS THE RESULT IN R5 EQUAL TO TEMP3?
043470  001403                            BEQ     .+10
043472                            6$:
043472  004767  015030                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                   ;EITHER INCORRECT R5 OR INCORRECT SEQUENCE
043476  000014                            14              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)

043500  021137  042140                    CMP     (R1),@#COUNT     ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043504  001372                            BNE     6$               ;IF NOT GO TO THE HLT ABOVE
043506  010105                            MOV     R1,R5            ;RESTORE R5
043510  005215                            INC     (R5)
043512  010767  134454                    MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
043516  021527  000037                    CMP     (R5),#37         ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                   ;LEFT BY 14. AND RIGHT BY 14.?
043522  002010                            BGE     8$               ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043524  005237  042146                    INC     @#TEMP2
043530  006367  176414                    ASL     TEMP3            ;SHIFT TEMP3 LEFT
043534  021527  000020                    CMP     (R5),#20         ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043540  001405                            BEQ     NEGAT            ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043542  000402                            BR      10$
043544  004767  000032            8$:     JSR     PC,TST37
043550  000167  176626            10$:    JMP     ASTART           ;GO BACK TO START
043554  012737  040000  042144    NEGAT:  MOV     #40000,@#TEMP1   ;TEMP1=40000
043562  012737  177762  042146            MOV     #177762,@#TEMP2  ;TEMP2=177762
043570  012737  000001  042150            MOV     #1,@#TEMP3       ;TEMP3=1
043576  000167  176600                    JMP     ASTART
043602  021527  000037            TST37:  CMP     (R5),#37         ;IS IT TEST 37?
043606  001013                            BNE     TST40            ;IF NOT THEN TRY TEST 40
043610  005037  042144                    CLR     @#TEMP1          ;0
043614  012737  000020  042146            MOV     #16.,@#TEMP2     ;SHIFTED BY 16
043622  005037  042150                    CLR     @#TEMP3          ;IS=0
043626  012737  000004  042152            MOV     #4,@#TEMP4       ;AND PS=4
043634  000207                            RTS     PC
043636  021527  000040            TST40:  CMP     (R5),#40         ;IS IT TEST 40?
043642  001003                            BNE     TST41            ;IF NOT THEN TRY TEST 41
043644  005037  042146                    CLR     @#TEMP2          ;0 SHIFTED BY 0=0 AND PS=4
043650  000207                            RTS     PC
043652  021527  000041            TST41:  CMP     (R5),#41         ;IS IT TEST 41?
043656  001004                            BNE     TST42            ;IF NOT THEN TRY TEST 42
043660  012737  177760  042146            MOV     #-16.,@#TEMP2    ;0 SHIFTED BY -16.=0 AND PS=4
043666  000207                            RTS     PC
043670  021527  000042            TST42:  CMP     (R5),#42         ;IS IT TEST 42?
043674  001013                            BNE     TST43            ;IF NOT THEN TRY TEST 43
043676  012737  100000  042144            MOV     #100000,@#TEMP1  ;100000
043704  005237  042146                    INC     @#TEMP2          ;SHIFTED BY -15
043710  005337  042150                    DEC     @#TEMP3          ;IS=-1
043714  012737  000010  042152            MOV     #10,@#TEMP4              ;AND PS=10
043722  000207                            RTS     PC
043724  021527  000043            TST43:  CMP     (R5),#43         ;IS IT TEST 43?
043730  001012                            BNE     TST44            ;IF NOT THEN IF NOT THEN TRY TEST 44
043732  012737  125252  042144            MOV     #125252,@#TEMP1  ;125252
043740  012737  177777  042146            MOV     #-1,@#TEMP2      ;SHIFTED BY -1
043746  012737  152525  042150            MOV     #152525,@#TEMP3  ;IS=152525 AND PS=10
043754  000207                            RTS     PC
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043756  021527  000044           TST44:  CMP     (R5),#44           ;IS IT TEST 44?
043762  001012                           BNE     TST45              ;IF NOT THEN TRY TEST 45
043764  012737  000001  042146           MOV     #1,@#TEMP2         ;125252 SHIFTED BY 1
043772  012737  052524  042150           MOV     #52524,@#TEMP3     ;IS=52524
044000  012737  000003  042152           MOV     #3,@#TEMP4         ;AND PS=3
044006  000207                           RTS     PC
044010  021527  000045           TST45:  CMP     (R5),#45           ;IS IT TEST 45?
044014  001012                           BNE     TST46              ;IF NOT THEN TRY TEST 46
044016  012737  177776  042146           MOV     #-2,@#TEMP2        ;125252 SHIFTED BY -2
044024  012737  165252  042150           MOV     #165252,@#TEMP3    ;IS=165252
044032  012737  000011  042152           MOV     #11,@#TEMP4        ;AND PS=11
044040  000207                           RTS     PC
044042  021527  000046           TST46:  CMP     (R5),#46           ;IS IT TEST 46?
044046  001014                           BNE     TST47              ;IF NOT THEN TRY TEST 47
044050  012737  177777  042144           MOV     #-1,@#TEMP1        ;-1
044056  012737  000020  042146           MOV     #16.,@#TEMP2       ;SHIFTED BY 15.
044064  005037  042150                   CLR     @#TEMP3            ;IS=0
044070  012737  000007  042152           MOV     #7,@#TEMP4         ;AND PS=7
044076  000207                           RTS     PC
044100  021527  000047           TST47:  CMP     (R5),#47           ;IS IT TEST 47?
044104  001011                           BNE     TST50              ;IF NOT THEN TRY TEST 50
044106  005337  042146                   DEC     @#TEMP2            ;-1 SHIFTED BY 15
044112  012737  100000  042150           MOV     #100000,@#TEMP3    ;IS=100000
044120  012737  000011  042152           MOV     #11,@#TEMP4        ;AND PS=11
044126  000207                           RTS     PC
044130  021527  000050           TST50:  CMP     (R5),#50           ;IS IT TEST 50
044134  001007                           BNE     ENT51              ;IF NOT THEN TRY TEST 51
044136  012737  137777  042144           MOV     #137777,@#TEMP1    ;137777 SHIFTED BY 15. IS=100000
044144  012737  000013  042152           MOV     #13,@#TEMP4        ;AND PS=13
044152  000207                           RTS     PC
044154  021527  000051           ENT51:  CMP     (R5),#51           ;IS IT ENTERING TEST 51?
044160  001403                           BEQ     .+10
044162  004767  014340                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;TEST NUMBER GOOFED
044166  000015                           15                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)



044170  005726                           TST     (SP)+              ;RESTORE STACK POINTER
044172  012704  177771                   MOV     #-7,%4
044176  012702  042164                   MOV     #S1,%2
044202  012703  042166                   MOV     #S2,%3
```

```
                                         ;*************************************************************************
                                         ;TEST:51    11/34    ASH      125252 SHIFTED BY #5 = 52500   PS = 3
                                         ;*************************************************************************

044206  010767  133760                   TST51:  MOV     PC,LPADR              ;STORE ERROR LOOP ADDRESS
044212  012701  125252                           MOV     #125252,%1            ;LOAD R1 WITH 125252
044216  072127  000005                           ASH     #5,%1                 ;SHIFT R1 BY #5
044222  106737  042142                           MFPS    @#PSWORD              ;SAVE PS
044226  122737  000003  042142                   CMPB    #3,@#PSWORD           ;IS THE PS 3?
044234  001403                                   BEQ     .+10
044236  004767  014264                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;THE PS IS NOT EQUAL TO 3
044242  000016                                   16              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

044244  022701  052500                           CMP     #52500,%1             ;IS THE RESULT 52500?
044250  001403                                   BEQ     .+10
044252                                   1$:
044252  004767  014250                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;R1 IS NOT EQUAL TO 52500 OR INCORRECT SEQUENCE
044256  000017                                   17              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

044260  021527  000051                           CMP     (R5),#51                      ;IS $TESTN = #51
044264  001372                                   BNE     1$                    ;IF NOT THEN GO TO HLT ABOVE
044266  005215                                   INC     (R5)



                                         ;*************************************************************************
                                         ;TEST:52    11/34    ASH      125252 SHIFTED BY @S2 = 177525   PS = 10
                                         ;*************************************************************************

044270  010767  133676                   TST52:  MOV     PC,LPADR              ;STORE ERROR LOOP ADDRESS
044274  012700  125252                           MOV     #125252,%0            ;LOAD R0 WITH 125252
044300  072077  175662                           ASH     @S2,%0                ;SHIFT R0 BY @S2
044304  106737  042142                           MFPS    @#PSWORD              ;SAVE PS
044310  122737  000010  042142                   CMPB    #10,@#PSWORD          ;IS THE PS 10?
044316  001403                                   BEQ     .+10
044320  004767  014202                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;THE PS IS NOT EQUAL TO 10
044324  000020                                   20              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

044326  022700  177525                           CMP     #177525,%0            ;IS THE RESULT 177525?
044332  001403                                   BEQ     .+10
044334                                   1$:
044334  004767  014166                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044340  000021                                   21              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

044342  021527  000052                           CMP     (R5),#52                      ;IS $TESTN = #52
044346  001372                                   BNE     1$                    ;IF NOT THEN GO TO HLT ABOVE
044350  005215                                   INC     (R5)
```

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11958
11959
```

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                                    ;*************************************************************************
                                    ;TEST:53    11/34    ASH      125252 SHIFTED BY @#S1 = 177525  PS = 10
                                    ;*************************************************************************

044352  010767  133614              TST53:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044356  012700  125252                      MOV     #125252,%0              ;LOAD R0 WITH 125252
044362  072037  042164                      ASH     @#S1,%0                 ;SHIFT R0 BY @#S1
044366  106737  042142                      MFPS    @#PSWORD                ;SAVE PS
044372  122737  000010  042142              CMPB    #10,@#PSWORD            ;IS THE PS 10?
044400  001403                              BEQ     .+10
044402  004767  014120                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;THE PS IS NOT EQUAL TO 10
044406  000022                              22              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

044410  022700  177525                      CMP     #177525,%0              ;IS THE RESULT 177525?
044414  001403                              BEQ     .+10
044416                              1$:
044416  004767  014104                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044422  000023                              23              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

044424  021527  000053                      CMP     (R5),#53                        ;IS $TESTN = #53
044430  001372                              BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044432  005215                              INC     (R5)



                                    ;*************************************************************************
                                    ;TEST:54    11/34    ASH      125252 SHIFTED BY (2) = 177525  PS = 10
                                    ;*************************************************************************

044434  010767  133532              TST54:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044440  012700  125252                      MOV     #125252,%0              ;LOAD R0 WITH 125252
044444  072012                              ASH     (2),%0                  ;SHIFT R0 BY (2)
044446  106737  042142                      MFPS    @#PSWORD                ;SAVE PS
044452  122737  000010  042142              CMPB    #10,@#PSWORD            ;IS THE PS 10?
044460  001403                              BEQ     .+10
044462  004767  014040                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;THE PS IS NOT EQUAL TO 10
044466  000024                              24              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

044470  022700  177525                      CMP     #177525,%0              ;IS THE RESULT 177525?
044474  001403                              BEQ     .+10
044476                              1$:
044476  004767  014024                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044502  000025                              25              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

044504  021527  000054                      CMP     (R5),#54                        ;IS $TESTN = #54
044510  001372                              BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044512  005215                              INC     (R5)
```

12016
12017

```
                                        ;*****************************************************************
                                        ;TEST:55    11/34   ASH     125252 SHIFTED BY (2)+ = 177525  PS = 10
                                        ;*****************************************************************

044514  010767  133452                  TST55:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
044520  012700  125252                          MOV     #125252,%0          ;LOAD R0 WITH 125252
044524  072022                                  ASH     (2)+,%0             ;SHIFT R0 BY (2)+
044526  106737  042142                          MFPS    @#PSWORD            ;SAVE PS
044532  122737  000010  042142                  CMPB    #10,@#PSWORD        ;IS THE PS 10?
044540  001403                                  BEQ     .+10
044542  004767  013760                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;THE PS IS NOT EQUAL TO 10
044546  000026                                  26              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044550  022700  177525                          CMP     #177525,%0          ;IS THE RESULT 177525?
044554  001403                                  BEQ     .+10
044556                                  1$:
044556  004767  013744                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044562  000027                                  27              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044564  021527  000055                          CMP     (R5),#55                    ;IS $TESTN = #55
044570  001372                                  BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
044572  005215                                  INC     (R5)



                                        ;*****************************************************************
                                        ;TEST:56    11/34   ASH     125252 SHIFTED BY -(2) = 177525  PS = 10
                                        ;*****************************************************************

044574  010767  133372                  TST56:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
044600  012700  125252                          MOV     #125252,%0          ;LOAD R0 WITH 125252
044604  072042                                  ASH     -(2),%0             ;SHIFT R0 BY -(2)
044606  106737  042142                          MFPS    @#PSWORD            ;SAVE PS
044612  122737  000010  042142                  CMPB    #10,@#PSWORD        ;IS THE PS 10?
044620  001403                                  BEQ     .+10
044622  004767  013700                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;THE PS IS NOT EQUAL TO 10
044626  000030                                  30              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044630  022700  177525                          CMP     #177525,%0          ;IS THE RESULT 177525?
044634  001403                                  BEQ     .+10
044636                                  1$:
044636  004767  013664                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044642  000031                                  31              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044644  021527  000056                          CMP     (R5),#56                    ;IS $TESTN = #56
044650  001372                                  BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
044652  005215                                  INC     (R5)
```

12074
12075

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                                        ;*******************************************************************
                                        ;TEST:57   11/34   ASH     125252 SHIFTED BY 2(3) = 177252  PS = 11
                                        ;*******************************************************************

044654  010767  133312                  TST57:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044660  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
044664  072063  000002                          ASH     2(3),%0                 ;SHIFT R0 BY 2(3)
044670  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
044674  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS THE PS 11?
044702  001403                                  BEQ     .+10
044704  004767  013616                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
044710  000032                                  32              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044712  022700  177252                          CMP     #177252,%0              ;IS THE RESULT 177252?
044716  001403                                  BEQ     .+10
044720                                  1$:
044720  004767  013602                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177252 OR INCORRECT SEQUENCE
044724  000033                                  33              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044726  021527  000057                          CMP     (R5),#57                        ;IS $TESTN = #57
044732  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044734  005215                                  INC     (R5)



                                        ;*******************************************************************
                                        ;TEST:60   11/34   ASH     125252 SHIFTED BY @(3) = 177525  PS = 10
                                        ;*******************************************************************

044736  010767  133230                  TST60:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044742  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
044746  072073  000000                          ASH     @(3),%0                 ;SHIFT R0 BY @(3)
044752  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
044756  122737  000010  042142                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
044764  001403                                  BEQ     .+10
044766  004767  013534                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044772  000034                                  34              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044774  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
045000  001403                                  BEQ     .+10
045002                                  1$:
045002  004767  013520                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045006  000035                                  35              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

045010  021527  000060                          CMP     (R5),#60                        ;IS $TESTN = #60
045014  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
045016  005215                                  INC     (R5)
```

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12132
12133
```

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                                        ;*************************************************************************
                                        ;TEST:61   11/34   ASH    125252 SHIFTED BY @(3)+ = 177525  PS = 10
                                        ;*************************************************************************

045020  010767  133146                  TST61:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
045024  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
045030  072033                                  ASH     @(3)+,%0                ;SHIFT R0 BY @(3)+
045032  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
045036  122737  000010  042142                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
045044  001403                                  BEQ     .+10
045046  004767  013454                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;THE PS IS NOT EQUAL TO 10
045052  000036                                  36                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

045054  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
045060  001403                                  BEQ     .+10
045062                                  1$:
045062  004767  013440                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045066  000037                                  37                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

045070  021527  000061                          CMP     (R5),#61                        ;IS $TESTN = #61
045074  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
045076  005215                                  INC     (R5)



                                        ;*************************************************************************
                                        ;TEST:62   11/34   ASH    125252 SHIFTED BY @-(3) = 177525  PS = 10
                                        ;*************************************************************************

045100  010767  133066                  TST62:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
045104  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
045110  072053                                  ASH     @-(3),%0                ;SHIFT R0 BY @-(3)
045112  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
045116  122737  000010  042142                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
045124  001403                                  BEQ     .+10
045126  004767  013374                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;THE PS IS NOT EQUAL TO 10
045132  000040                                  40                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

045134  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
045140  001403                                  BEQ     .+10
045142                                  1$:
045142  004767  013360                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045146  000041                                  41                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

045150  021527  000062                          CMP     (R5),#62                        ;IS $TESTN = #62
045154  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
045156  005215                                  INC     (R5)
```

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12190
12191
```

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




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



045160  010767  133006                    MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
045164  012737  000062  042140            MOV     #62,@#COUNT
045172  005037  042144                    CLR     @#TEMP1           ;TEMP1=0
045176  012737  000001  042146            MOV     #1,@#TEMP2        ;TEMP2=1
045204  005037  042150                    CLR     @#TEMP3           ;TEMP3=0
045210  005037  042152                    CLR     @#TEMP4           ;TEMP4=0
045214  012737  000001  042154            MOV     #1,@#TEMP5        ;TEMP5=1
045222  005037  042156                    CLR     @#TEMP6           ;0 1 SHIFTED BY 0=0 1, PS=0

045226  010502                   REG01:   MOV     R5,R2             ;SAVE R5
045230  013700  042144                    MOV     @#TEMP1,%0        ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 0
045234  013701  042146                    MOV     @#TEMP2,%0!1      ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 1
045240  000241                            CLC
045242  032737  000001  000306            BIT     #1,@#$PASS        ;IS IT AN EVEN PASS ?
045250  001004                            BNE     2$                ;IF NOT THEN GO TO 2$
045252  013705  042150                    MOV     @#TEMP3,R5        ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045256  073005                            ASHC    R5,R0             ;USING R0
045260  000402                            BR      4$
045262  073067  174662           2$:      ASHC    TEMP3,%0          ;ASHC REGISTER 0 BY THE CONTENTS OF TEMP3
045266  106737  042142           4$:      MFPS    @#PSWORD          ;SAVE PS
045272  123737  042156  042142            CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045300  001403                            BEQ     .+10
045302  004767  013220                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG PS
045306  000042                            42                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045310  005237  042140                    INC     @#COUNT
045314  023700  042152                    CMP     @#TEMP4,%0        ;IS THE RESULT IN R0 SAME AS TEMP4?
045320  001403                            BEQ     .+10
045322  004767  013200                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG RESULT IN R0
045326  000043                            43                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045330  023701  042154                    CMP     @#TEMP5,%1        ;IS THE RESULT IN R1 SAME AS TEMP5?
045334  001403                            BEQ     .+10              ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                                    ;AND PS=TEMP6
045336  004767  013164                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG RESULT IN R1
045342  000044                            44                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045344  010205                            MOV     R2,R5             ;RESTORE R5
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045346  021537  042140                    CMP     (R5),@#COUNT      ;IS TEST NUMBER=COUNTER?
045352  001403                            BEQ     .+10
045354  004767  013146                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;NO
045360  000045                            45                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045362  005215                            INC     (R5)
045364  021527  000160                    CMP     (R5),#160         ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045370  002014                            BGE     6$                ;YES
045372  005237  042150                    INC     @#TEMP3
045376  000241                            CLC
045400  006137  042154                    ROL     @#TEMP5           ;ROTATE TEMP5 LEFT BY 1 PLACE
045404  006137  042152                    ROL     @#TEMP4           ;INTRODUCE CARRY FROM TEMP4 IN TEMP5
045410  021527  000121                    CMP     (R5),#121         ;IS IT TEST 121?
045414  001004                            BNE     REGR23
045416  004467  000414                    JSR     R4,RITSH          ;IF SO THEN GO AND INITIATE RIGHT SHIFT
045422  004767  000444           6$:      JSR     %7,TST160
045426  010767  132540           REGR23:  MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
045432  013702  042144                    MOV     @#TEMP1,%2        ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 2
045436  013703  042146                    MOV     @#TEMP2,%2!1      ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 3
045442  000241                            CLC
045444  032737  000001  000306            BIT     #1,@#$PASS        ;IS IT AN EVEN PASS ?
045452  001004                            BNE     2$                ;IF NOT THEN GO TO 2$
045454  013704  042150                    MOV     @#TEMP3,R4        ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045460  073204                            ASHC    R4,R2             ;USING R2
045462  000402                            BR      4$
045464  073267  174460           2$:      ASHC    TEMP3,%2          ;ASHC REGISTER 2 BY THE CONTETNS OF TEMP3
045470  106737  042142           4$:      MFPS    @#PSWORD          ;SAVE PS
045474  123737  042156  042142            CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045502  001403                            BEQ     .+10
045504  004767  013016                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG PS
045510  000046                            46                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045512  005237  042140                    INC     @#COUNT
045516  023702  042152                    CMP     @#TEMP4,%2        ;IS THE RESULT IN R2 SAME AS TEMP4?
045522  001403                            BEQ     .+10
045524  004767  012776                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG RESULT IN R2
045530  000047                            47                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045532  023703  042154                    CMP     @#TEMP5,%3        ;IS THE RESULT IN R3 SAME AS TEMP5?
045536  001403                            BEQ     .+10              ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                            ;AND PS=TEMP6
045540  004767  012762                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG RESULT IN R1
045544  000050                            50                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045546  021537  042140                    CMP     (R5),@#COUNT      ;IS TEST NUMBER=COUNTER?
045552  001403                            BEQ     .+10
045554  004767  012746                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;NO
```

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045560  000051                                51                   ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                   ;BY  (013746  000172  000207)

045562  005215                                INC     (R5)
045564  021527  000160                        CMP     (R5),#160         ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045570  002014                                BGE     6$                ;YES
045572  005237  042150                        INC     @#TEMP3
045576  000241                                CLC
045600  006137  042154                        ROL     @#TEMP5           ;ROTATE TEMP5 LEFT BY 1 PLACE
045604  006137  042152                        ROL     @#TEMP4           ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
045610  021527  000121                        CMP     (R5),#121         ;IS IT TEST 121?
045614  001004                                BNE     REG45
045616  004467  000214                        JSR     R4,RITSH          ;IF SO THEN GO AND INITIATE RIGHT SHIFT
045622  004767  000244               6$:      JSR     %7,TST160
045626  010767  132340               REG45:   MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
045632  010501                                MOV     R5,R1             ;SAVE R5
045634  013704  042144                        MOV     @#TEMP1,%4        ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 4
045640  013705  042146                        MOV     @#TEMP2,%4!1      ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 5
045644  000241                                CLC
045646  032737  000001  000306                BIT     #1,@#$PASS        ;IS IT AN EVEN PASS ?
045654  001004                                BNE     2$                ;IF NOT THEN GO TO 2$
045656  013700  042150                        MOV     @#TEMP3,R0        ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045662  073400                                ASHC    R0,R4             ;USING R4
045664  000402                                BR      4$
045666  073467  174256               2$:      ASHC    TEMP3,%4          ;ASHC REGISTER 4 BY THE CONTENTS OF TEMP3
045672  106737  042142               4$:      MFPS    @#PSWORD          ;SAVE PS
045676  123737  042156  042142                CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045704  001403                                BEQ     .+10
045706  004767  012614                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG PS
045712  000052                                52                   ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                   ;BY  (013746  000172  000207)

045714  005237  042140                        INC     @#COUNT
045720  023704  042152                        CMP     @#TEMP4,%4        ;IS THE RESULT IN R4 SAME AS TEMP4?
045724  001403                                BEQ     .+10
045726  004767  012574                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG RESULT IN R4
045732  000053                                53                   ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                   ;BY  (013746  000172  000207)

045734  023705  042154                        CMP     @#TEMP5,%5        ;IS THE RESULT IN R5 SAME AS TEMP5?
045740  001403                                BEQ     .+10              ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                                        ;AND PS=TEMP6
045742  004767  012560                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG RESULT IN R5
045746  000054                                54                   ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                   ;BY  (013746  000172  000207)

045750  021137  042140                        CMP     (R1),@#COUNT      ;IS TEST NUMBER=COUNTER?
045754  001403                                BEQ     .+10
045756  004767  012544                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;NO
045762  000055                                55                   ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                   ;BY  (013746  000172  000207)
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045764  010105                           MOV   R1,R5              ;RESTORE R5
045766  005215                           INC   (R5)
045770  021527  000160                   CMP   (R5),#160          ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045774  002014                           BGE   6$                 ;YES
045776  005237  042150                   INC   @#TEMP3
046002  000241                           CLC
046004  006137  042154                   ROL   @#TEMP5            ;ROTATE TEMP5 LEFT BY 1 PLACE
046010  006137  042152                   ROL   @#TEMP4            ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
046014  021527  000121                   CMP   (R5),#121          ;IS IT TEST 121?
046020  001004                           BNE   8$
046022  004467  000010                   JSR   R4,RITSH           ;IF SO THEN GO AND INITIATE RIGHT SHIFT
046026  004767  000040           6$:     JSR   %7,TST160
046032  000167  177170           8$:     JMP   REG01
046036  022424                   RITSH:  CMP   (R4)+,(R4)+        ;MAKE R4 POINT TO THE NEXT REG TAG
046040  012737  040000  042144           MOV   #40000,@#TEMP1     ;TEMP1=4000
046046  005037  042146                   CLR   @#TEMP2            ;TEMP2=0
046052  012737  177742  042150           MOV   #-30.,@#TEMP3      ;TEMP3=-30
046060  005037  042152                   CLR   @#TEMP4            ;TEMP4=0
046064  005237  042154                   INC   @#TEMP5            ;TEMP5=1
046070  000204                           RTS   R4
046072  021527  000160           TST160: CMP   (R5),#160          ;IS IT TEST 160
046076  001010                           BNE   TST161             ;IF NOT THEN TRY TEST 161
046100  005037  042144                   CLR   @#TEMP1            ;0 0 SHIFTED BY 0
046104  005037  042152                   CLR   @#TEMP4            ;IS EQUAL TO 0 0
046110  012737  000004  042156           MOV   #4,@#TEMP6         ;AND PS=4
046116  000207                           RTS   %7
046120  021527  000161           TST161: CMP   (R5),#161          ;IS IT TEST 161
046124  001004                           BNE   TST162
046126  012737  177746  042150           MOV   #-32,@#TEMP3       ;0 0 SHIFTED BY -32=0 0, PS=4
046134  000207                           RTS   %7
046136  021527  000162           TST162: CMP   (R5),#162          ;IS IT TEST 162
046142  001004                           BNE   TST163             ;IF NOT THEN TRY TEST 163
046144  012737  000032  042150           MOV   #32,@#TEMP3        ;0 0 SHIFTED BY 32=0 0, PS=4
046152  000207                           RTS   %7
046154  021527  000163           TST163: CMP   (R5),#163          ;IS IT TEST 163?
046160  001016                           BNE   TST164             ;IF NOT THEN TRY TEST 164
046162  012737  052525  042144           MOV   #52525,@#TEMP1     ;52525 0
046170  012737  177760  042150           MOV   #-16.,@#TEMP3      ;SHIFTED BY -16.
046176  005037  042152                   CLR   @#TEMP4
046202  012737  052525  042154           MOV   #52525,@#TEMP5     ;IS EQUAL TO 0 52525
046210  005037  042156                   CLR   @#TEMP6            ;AND PS = 0
046214  000207                           RTS   %7
046216  021527  000164           TST164: CMP   (R5),#164          ;IS IT TEST 164?
046222  001014                           BNE   TST165             ;IF NOT THEN TRY TEST 165
046224  012737  125252  042144           MOV   #125252,@#TEMP1    ;125252 0 SHIFTED BY -16.
046232  005337  042152                   DEC   @#TEMP4
046236  012737  125252  042154           MOV   #125252,@#TEMP5    ;IS EQUAL TO -1 125252
046244  012737  000010  042156           MOV   #10,@#TEMP6        ;AND PS=10
046252  000207                           RTS   %7
046254  021527  000165           TST165: CMP   (R5),#165          ;IS IT TEST 165?
046260  001007                           BNE   TST166             ;IF NOT THEN TRY TEST 166
046262  012737  177777  042144           MOV   #-1,@#TEMP1        ;-1 0 SHIFTED BY -16
046270  012737  177777  042154           MOV   #-1,@#TEMP5        ;IS EQUAL TO -1 -1, AND PS=10
046276  000207                           RTS   %7
046300  021527  000166           TST166: CMP   (R5),#166          ;IS IT TEST 166?
046304  001011                           BNE   TST167             ;IF NOT THEN TRY TEST 167
```

```
046306 012737 100000 042144           MOV     #100000,@#TEMP1 ;100000 0
046314 012737 177740 042150           MOV     #-32.,@#TEMP3   ;SHIFTED BY -32 IS EQUAL TO -1 -1
046322 005237 042156                  INC     @#TEMP6         ;AND PS=11
046326 000207                         RTS     %7
046330 021527 000167         TST167:  CMP     (R5),#167       ;IS IT TEST 167?
046334 001014                         BNE     TST170          ;IF NOT THEN TRY TEST 170
046336 005037 042144                  CLR     @#TEMP1
046342 005337 042146                  DEC     @#TEMP2         ;0 -1
046346 012737 000020 042150           MOV     #16.,@#TEMP3    ;SHIFTED BY 16.
046354 005037 042154                  CLR     @#TEMP5         ;IS EQUAL TO -1 0
046360 005237 042156                  INC     @#TEMP6         ;AND PS=12
046364 000207                         RTS     %7
046366 021527 000170         TST170:  CMP     (R5),#170       ;IS IT TEST 170?
046372 001007                         BNE     TST171          ;IF NOT THEN TRY TEST 171
046374 012737 125252 042146           MOV     #125252,@#TEMP2 ;0 125252 SHIFTED BY 16
046402 012737 125252 042152           MOV     #125252,@#TEMP4 ;IS EQUAL TO 125252 0, AND PS=12
046410 000207                         RTS     %7
046412 021527 000171         TST171:  CMP     (R5),#171       ;IS IT TEST 171?
046416 001010                         BNE     TST172          ;IF NOT THEN TRY TEST 172
046420 005337 042150                  DEC     @#TEMP3         ;0 125252 SHIFTED BY 15
046424 012737 052525 042152           MOV     #52525,@#TEMP4  ;IS EQUAL TO 52525 0
046432 005037 042156                  CLR     @#TEMP6         ;AND PS=0
046436 000207                         RTS     %7
046440 021527 000172         TST172:  CMP     (R5),#172       ;IS IT TEST 172?
046444 001006                         BNE     TST173          ;IF NOT THEN TRY TEST 173
046446 012737 052525 042146           MOV     #52525,@#TEMP2  ;0 52525
046454 005237 042150                  INC     @#TEMP3         ;SHIFTED BY 16. IS EQUAL TO 52525 0, AND PS=0
046460 000207                         RTS     %7
046462 021527 000173         TST173:  CMP     (R5),#173       ;IS IT TEST 173?
046466 001014                         BNE     TST174          ;IF NOT THEN TRY TEST 174
046470 012737 177777 042146           MOV     #-1,@#TEMP2     ;0 -1
046476 005337 042150                  DEC     @#TEMP3         ;SHIFTED BY 15.
046502 012737 077777 042152           MOV     #77777,@#TEMP4
046510 012737 100000 042154           MOV     #100000,@#TEMP5 ;IS EQUAL TO 77777 100000, AND PS=0
046516 000207                         RTS     %7
046520 021527 000174         TST174:  CMP     (R5),#174       ;IS IT TEST 174?
046524 001013                         BNE     TST175          ;IF NOT THEN TRY TEST 175
046526 012737 100000 042144           MOV     #100000,@#TEMP1
046534 005337 042146                  DEC     @#TEMP2         ;100000 -2 SHIFTED BY 15.
046540 005037 042154                  CLR     @#TEMP5         ;IS EQUAL TO 77777 0
046544 012737 000002 042156           MOV     #2,@#TEMP6      ;AND PS=2
046552 000207                         RTS     %7
046554 021527 000175         TST175:  CMP     (R5),#175       ;IS IT TEST 175?
046560 001015                         BNE     ENT176          ;IF NOT THEN TRY TEST 176
046562 012737 177777 042144           MOV     #-1,@#TEMP1
046570 005037 042146                  CLR     @#TEMP2         ;-1 0
046574 005237 042150                  INC     @#TEMP3         ;SHIFTED BY 16.
046600 005037 042152                  CLR     @#TEMP4         ;IS EQUAL TO 0 0
046604 012737 000007 042156           MOV     #7,@#TEMP6      ;AND PS=7
046612 000207                         RTS     %7
046614 021527 000176         ENT176:  CMP     (R5),#176       ;IS THE PROGRM ENTERING TEST 176?
046620 001403                         BEQ     .+10
046622 004767 011700                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;TEST NUMBER GOOFED
046626 000056                         56              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)
```

```
046630 005726                    TST     (SP)+                ;RESTORE STACK POINTER
```

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

046632  010767  131334                  TST176: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
046636  012701  000000                          MOV     #DUMMY,%1               ;LOAD R1 WITH DUMMY
046642  012701  000001                          MOV     #1,%1!1                 ;LOAD R1!1 WITH 1
046646  000241                                  CLC
046650  073127  000010                          ASHC    #8.,%1                  ;SHIFT R1,R1!1 BY 8.
046654  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
046660  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS THE PS 0?
046666  001403                                  BEQ     .+10
046670  004767  011632                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 0
046674  000057                                  57              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

046676  022701  000400                          CMP     #400,%1                 ;IS THE RESULT 400?
046702  001403                                  BEQ     .+10
046704  004767  011616                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R1 IS NOT EQUAL TO 400
046710  000060                                  60              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

046712  021527  000176                          CMP     (R5),#176                       ;IS $TESTN = #176?
046716  001403                                  BEQ     .+10                    ;IF NOT THEN GO TO HLT
046720  004767  011602                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
046724  000061                                  61              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

046726  005215                                  INC     (R5)



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

046730  010767  131236                  TST177: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
046734  012703  000000                          MOV     #DUMMY,%3               ;LOAD R3 WITH DUMMY
046740  012703  177777                          MOV     #-1,%3!1                ;LOAD R3!1 WITH -1
046744  000241                                  CLC
046746  073327  000017                          ASHC    #15.,%3                 ;SHIFT R3,R3!1 BY 15.
046752  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
046756  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS THE PS 11?
046764  001403                                  BEQ     .+10
046766  004767  011534                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
046772  000062                                  62              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

046774  022703  100000                          CMP     #100000,%3              ;IS THE RESULT 100000?
047000  001403                                  BEQ     .+10
047002  004767  011520                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R3 IS NOT EQUAL TO 100000
047006  000063                                  63              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
```

```
12532                                                   ;BY  (013746  000172  000207)
12533
12534  047010  021527  000177          CMP     (R5),#177                ;IS $TESTN = #177?
12535  047014  001403                  BEQ     .+10              ;IF NOT THEN GO TO HLT
12536  047016  004767  011504          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
12537                                                            ;TEST IS IN WRONG SEQUENCE
12538  047022  000064                  64              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
12539                                                  ;BY  (013746  000172  000207)
12540
12541  047024  005215                  INC     (R5)
12542
12543
```

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

047026  010767  131140                TST200: MOV   PC,LPADR            ;STORE ERROR LOOP ADDRESS
047032  010501                                MOV   R5,R1               ;SAVE R5
047034  012705  000000                        MOV   #DUMMY,%5           ;LOAD R5 WITH DUMMY
047040  012705  052525                        MOV   #52525,%5!1         ;LOAD R5!1 WITH 52525
047044  000241                                CLC
047046  073527  000000                        ASHC  #0,%5               ;SHIFT R5,R5!1 BY 0
047052  106737  042142                        MFPS  @#PSWORD            ;SAVE PS
047056  122737  000000  042142                CMPB  #0,@#PSWORD         ;IS THE PS 0?
047064  001403                                BEQ   .+10
047066  004767  011434                        JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 0
047072  000065                                65                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047074  022705  052525                        CMP   #52525,%5           ;IS THE RESULT 52525?
047100  001403                                BEQ   .+10
047102  004767  011420                        JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R5 IS NOT EQUAL TO 52525
047106  000066                                66                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047110  010105                                MOV   R1,R5               ;RESTORE R5
047112  021527  000200                        CMP   (R5),#200                   ;IS $TESTN = #200?
047116  001403                                BEQ   .+10                ;IF NOT THEN GO TO HLT
047120  004767  011402                        JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
047124  000067                                67                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047126  005215                                INC   (R5)



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

047130  010767  131036                TST201: MOV   PC,LPADR            ;STORE ERROR LOOP ADDRESS
047134  012701  000000                        MOV   #DUMMY,%1           ;LOAD R1 WITH DUMMY
047140  012701  020010                        MOV   #20010,%1!1         ;LOAD R1!1 WITH 20010
047144  000241                                CLC
047146  073127  177763                        ASHC  #-13.,%1            ;SHIFT R1,R1!1 BY -13.
047152  106737  042142                        MFPS  @#PSWORD            ;SAVE PS
047156  122737  000000  042142                CMPB  #0,@#PSWORD         ;IS THE PS 0?
047164  001403                                BEQ   .+10
047166  004767  011334                        JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 0
047172  000070                                70                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047174  022701  000101                        CMP   #101,%1             ;IS THE RESULT 101?
047200  001403                                BEQ   .+10
047202  004767  011320                        JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
                                                        ;R1 IS NOT EQUAL TO 101
047206  000071                      71          ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                ;BY  (013746  000172  000207)

047210  021527  000201              CMP     (R5),#201               ;IS $TESTN = #201?
047214  001403                      BEQ     .+10            ;IF NOT THEN GO TO HLT
047216  004767  011304              JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047222  000072                      72          ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                ;BY  (013746  000172  000207)

047224  005215                      INC     (R5)
```

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

047226  010767  130740                  TST202: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
047232  012703  000000                          MOV     #DUMMY,%3         ;LOAD R3 WITH DUMMY
047236  012703  177777                          MOV     #-1,%3!1          ;LOAD R3!1 WITH -1
047242  000241                                  CLC
047244  073327  000020                          ASHC    #16.,%3           ;SHIFT R3,R3!1 BY 16.
047250  106737  042142                          MFPS    @#PSWORD          ;SAVE PS
047254  122737  000011  042142                  CMPB    #11,@#PSWORD      ;IS THE PS 11?
047262  001403                                  BEQ     .+10
047264  004767  011236                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;THE PS IS NOT EQUAL TO 11
047270  000073                                  73              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047272  022703  000000                          CMP     #0,%3             ;IS THE RESULT 0?
047276  001403                                  BEQ     .+10
047300  004767  011222                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;R3 IS NOT EQUAL TO 0
047304  000074                                  74              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047306  021527  000202                          CMP     (R5),#202                 ;IS $TESTN = #202?
047312  001403                                  BEQ     .+10              ;IF NOT THEN GO TO HLT
047314  004767  011206                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;TEST IS IN WRONG SEQUENCE
047320  000075                                  75              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047322  005215                                  INC     (R5)



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

047324  010767  130642                  TST203: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
047330  010501                                  MOV     R5,R1             ;SAVE R5
047332  012705  000000                          MOV     #DUMMY,%5         ;LOAD R5 WITH DUMMY
047336  012705  000001                          MOV     #1,%5!1           ;LOAD R5!1 WITH 1
047342  000241                                  CLC
047344  073527  177777                          ASHC    #-1,%5            ;SHIFT R5,R5!1 BY -1
047350  106737  042142                          MFPS    @#PSWORD          ;SAVE PS
047354  122737  000001  042142                  CMPB    #1,@#PSWORD       ;IS THE PS 1?
047362  001403                                  BEQ     .+10
047364  004767  011136                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;THE PS IS NOT EQUAL TO 1
047370  000076                                  76              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047372  022705  100000                          CMP     #100000,%5        ;IS THE RESULT 100000?
047376  001403                                  BEQ     .+10
047400  004767  011122                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;R5 IS NOT EQUAL TO 100000
```

```
047404  000077                   77                    ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

047406  010105                   MOV     R1,R5                   ;RESTORE R5
047410  021527  000203           CMP     (R5),#203                         ;IS $TESTN = #203?
047414  001403                   BEQ     .+10                    ;IF NOT THEN GO TO HLT
047416  004767  011104           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;TEST IS IN WRONG SEQUENCE
047422  000100                   100                   ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

047424  005215                   INC     (R5)


```

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

047426  010767  130540                  TST204: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
047432  012701  000000                          MOV     #DUMMY,%1               ;LOAD R1 WITH DUMMY
047436  012701  125252                          MOV     #125252,%1!1            ;LOAD R1!1 WITH 125252
047442  000241                                  CLC
047444  073127  177760                          ASHC    #-16.,%1                ;SHIFT R1,R1!1 BY -16.
047450  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
047454  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS THE PS 11?
047462  001403                                  BEQ     .+10
047464  004767  011036                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
047470  000101                                  101             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047472  022701  125252                          CMP     #125252,%1              ;IS THE RESULT 125252?
047476  001403                                  BEQ     .+10
047500  004767  011022                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R1 IS NOT EQUAL TO 125252
047504  000102                                  102             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047506  021527  000204                          CMP     (R5),#204                       ;IS $TESTN = #204?
047512  001403                                  BEQ     .+10                    ;IF NOT THEN GO TO HLT
047514  004767  011006                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
047520  000103                                  103             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047522  005215                                  INC     (R5)



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

047524  010767  130442                  TST205: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
047530  012702  125252                          MOV     #125252,%2              ;LOAD R2 WITH 125252
047534  012703  125252                          MOV     #125252,%2!1            ;LOAD R2!1 WITH 125252
047540  000241                                  CLC
047542  073227  000025                          ASHC    #21.,%2                 ;SHIFT R2,R2!1 BY 21.
047546  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
047552  122737  000003  042142                  CMPB    #3,@#PSWORD             ;IS THE PS 3?
047560  001403                                  BEQ     .+10
047562  004767  010740                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 3
047566  000104                                  104             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047570  022702  052500                          CMP     #52500,%2               ;IS THE RESULT 52500?
047574  001403                                  BEQ     .+10
047576  004767  010724                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R2 IS NOT EQUAL TO 52500
047602  000105                                  105             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
```

```
                                                     ;BY  (013746  000172  000207)

047604  022703  000000          CMP     #000000,%2!1     ;IS THE RESULT 000000?
047610  001403                  BEQ     .+10
047612  004767  010710          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;R2!1 IS NOT EQUAL TO 000000
047616  000106                  106                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)

047620  021527  000205          CMP     (R5),#205                  ;IS $TESTN = #205?
047624  001403                  BEQ     .+10              ;IF NOT THEN GO TO HLT
047626  004767  010674          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;TEST IS IN WRONG SEQUENCE
047632  000107                  107                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)

047634  005215                  INC     (R5)



047636  012702  177771          MOV     #-7,%2
047642  012703  042164          MOV     #S1,%3
047646  012704  042166          MOV     #S2,%4
```

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

047652  010767  130314                 TST206: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
047656  012700  125252                         MOV     #125252,%0                  ;LOAD R0 WITH 125252
047662  012701  125252                         MOV     #125252,%0!1        ;LOAD R0!1 WITH 125252
047666  000241                                 CLC
047670  073067  172270                         ASHC    S1,%0               ;SHIFT R0,R0!1 BY S1
047674  106737  042142                         MFPS    @#PSWORD            ;SAVE PS
047700  122737  000010  042142                 CMPB    #10,@#PSWORD        ;IS THE PS 10?
047706  001403                                 BEQ     .+10
047710  004767  010612                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;THE PS IS NOT EQUAL TO 10
047714  000110                                 110             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)

047716  022700  177525                         CMP     #177525,%0          ;IS THE RESULT 177525?
047722  001403                                 BEQ     .+10
047724  004767  010576                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;R0 IS NOT EQUAL TO 177525
047730  000111                                 111             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)

047732  022701  052525                         CMP     #52525,%0!1         ;IS THE RESULT 52525?
047736  001403                                 BEQ     .+10
047740                                 1$:
047740  004767  010562                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
047744  000112                                 112             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)

047746  021527  000206                         CMP     (R5),#206                   ;IS THE $TESTN = #206?
047752  001372                                 BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
047754  005215                                 INC     (R5)


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

047756  010767  130210                 TST207: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
047762  012700  125252                         MOV     #125252,%0                  ;LOAD R0 WITH 125252
047766  012701  125252                         MOV     #125252,%0!1        ;LOAD R0!1 WITH 125252
047772  000241                                 CLC
047774  073077  172166                         ASHC    @S2,%0              ;SHIFT R0,R0!1 BY @S2
050000  106737  042142                         MFPS    @#PSWORD            ;SAVE PS
050004  122737  000010  042142                 CMPB    #10,@#PSWORD        ;IS THE PS 10?
050012  001403                                 BEQ     .+10
050014  004767  010506                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;THE PS IS NOT EQUAL TO 10
050020  000113                                 113             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)

050022  022700  177525                         CMP     #177525,%0          ;IS THE RESULT 177525?
050026  001403                                 BEQ     .+10
```

```
050030  004767  010472          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525
050034  000114                  114             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                ;BY  (013746  000172  000207)

050036  022701  052525          CMP     #52525,%0!1             ;IS THE RESULT 52525?
050042  001403                  BEQ     .+10
050044                  1$:
050044  004767  010456          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050050  000115                  115             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                ;BY  (013746  000172  000207)

050052  021527  000207          CMP     (R5),#207                       ;IS THE $TESTN = #207?
050056  001372                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
050060  005215                  INC     (R5)
```

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

050062  010767  130104                  TST210: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
050066  012700  125252                          MOV     #125252,%0                  ;LOAD R0 WITH 125252
050072  012701  125252                          MOV     #125252,%0!1       ;LOAD R0!1 WITH 125252
050076  000241                                  CLC
050100  073037  042164                          ASHC    @#S1,%0            ;SHIFT R0,R0!1 BY @#S1
050104  106737  042142                          MFPS    @#PSWORD           ;SAVE PS
050110  122737  000010  042142                  CMPB    #10,@#PSWORD       ;IS THE PS 10?
050116  001403                                  BEQ     .+10
050120  004767  010402                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;THE PS IS NOT EQUAL TO 10
050124  000116                                  116             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050126  022700  177525                          CMP     #177525,%0         ;IS THE RESULT 177525?
050132  001403                                  BEQ     .+10
050134  004767  010366                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;R0 IS NOT EQUAL TO 177525
050140  000117                                  117             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050142  022701  052525                          CMP     #52525,%0!1        ;IS THE RESULT 52525?
050146  001403                                  BEQ     .+10
050150                                  1$:
050150  004767  010352                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050154  000120                                  120             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050156  021527  000210                          CMP     (R5),#210                   ;IS THE $TESTN = #210?
050162  001372                                  BNE     1$                 ;IF NOT THEN GO TO HLT ABOVE
050164  005215                                  INC     (R5)


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

050166  010767  130000                  TST211: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
050172  012700  125252                          MOV     #125252,%0                  ;LOAD R0 WITH 125252
050176  012701  125252                          MOV     #125252,%0!1       ;LOAD R0!1 WITH 125252
050202  000241                                  CLC
050204  073013                                  ASHC    (3),%0             ;SHIFT R0,R0!1 BY (3)
050206  106737  042142                          MFPS    @#PSWORD           ;SAVE PS
050212  122737  000010  042142                  CMPB    #10,@#PSWORD       ;IS THE PS 10?
050220  001403                                  BEQ     .+10
050222  004767  010300                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;THE PS IS NOT EQUAL TO 10
050226  000121                                  121             ;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  010264                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050242  000122                          122                 ;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$:
050252  004767  010250                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050256  000123                          123                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

050260  021527  000211                  CMP     (R5),#211                   ;IS THE $TESTN = #211?
050264  001372                          BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
050266  005215                          INC     (R5)
```

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

050270  010767  127676                    TST212: 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  073023                                    ASHC    (3)+,%0           ;SHIFT R0,R0!1 BY (3)+
050310  106737  042142                            MFPS    @#PSWORD          ;SAVE PS
050314  122737  000010  042142                    CMPB    #10,@#PSWORD      ;IS THE PS 10?
050322  001403                                    BEQ     .+10
050324  004767  010176                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;THE PS IS NOT EQUAL TO 10
050330  000124                                    124               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050332  022700  177525                            CMP     #177525,%0        ;IS THE RESULT 177525?
050336  001403                                    BEQ     .+10
050340  004767  010162                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;R0 IS NOT EQUAL TO 177525
050344  000125                                    125               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050346  022701  052525                            CMP     #52525,%0!1       ;IS THE RESULT 52525?
050352  001403                                    BEQ     .+10
050354                                    1$:
050354  004767  010146                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050360  000126                                    126               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050362  021527  000212                            CMP     (R5),#212                 ;IS THE $TESTN = #212?
050366  001372                                    BNE     1$                ;IF NOT THEN GO TO HLT ABOVE
050370  005215                                    INC     (R5)


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

050372  010767  127574                    TST213: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
050376  012700  125252                            MOV     #125252,%0                 ;LOAD R0 WITH 125252
050402  012701  125252                            MOV     #125252,%0!1      ;LOAD R0!1 WITH 125252
050406  000241                                    CLC
050410  073043                                    ASHC    -(3),%0           ;SHIFT R0,R0!1 BY -(3)
050412  106737  042142                            MFPS    @#PSWORD          ;SAVE PS
050416  122737  000010  042142                    CMPB    #10,@#PSWORD      ;IS THE PS 10?
050424  001403                                    BEQ     .+10
050426  004767  010074                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;THE PS IS NOT EQUAL TO 10
050432  000127                                    127               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050434  022700  177525                            CMP     #177525,%0        ;IS THE RESULT 177525?
050440  001403                                    BEQ     .+10
```

```
050442  004767  010060           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                    ;R0 IS NOT EQUAL TO 177525
050446  000130                   130             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                 ;BY  (013746  000172  000207)

050450  022701  052525           CMP     #52525,%0!1        ;IS THE RESULT 52525?
050454  001403                   BEQ     .+10
050456                   1$:
050456  004767  010044           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                    ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050462  000131                   131             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                 ;BY  (013746  000172  000207)

050464  021527  000213           CMP     (R5),#213               ;IS THE $TESTN = #213?
050470  001372                   BNE     1$                 ;IF NOT THEN GO TO HLT ABOVE
050472  005215                   INC     (R5)
```

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

050474  010767  127472                  TST214: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
050500  012700  125252                          MOV     #125252,%0                      ;LOAD R0 WITH 125252
050504  012701  125252                          MOV     #125252,%0!1            ;LOAD R0!1 WITH 125252
050510  000241                                  CLC
050512  073064  000002                          ASHC    2(4),%0                 ;SHIFT R0,R0!1 BY 2(4)
050516  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
050522  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS THE PS 11?
050530  001403                                  BEQ     .+10
050532  004767  007770                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
050536  000132                                  132             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050540  022700  177252                          CMP     #177252,%0              ;IS THE RESULT 177252?
050544  001403                                  BEQ     .+10
050546  004767  007754                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177252
050552  000133                                  133             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050554  022701  125252                          CMP     #125252,%0!1            ;IS THE RESULT 125252?
050560  001403                                  BEQ     .+10
050562                                  1$:
050562  004767  007740                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0!1 IS NOT EQUAL TO 125252 OR INCORRECT SEQUENCE
050566  000134                                  134             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050570  021527  000214                          CMP     (R5),#214                       ;IS THE $TESTN = #214?
050574  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
050576  005215                                  INC     (R5)



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

050600  010767  127366                  TST215: 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  073074  000000                          ASHC    @(4),%0                 ;SHIFT R0,R0!1 BY @(4)
050622  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
050626  122737  000010  042142                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
050634  001403                                  BEQ     .+10
050636  004767  007664                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
050642  000135                                  135             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

050644  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
050650  001403                                  BEQ     .+10
```

```
050652  004767  007650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050656  000136                          136                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

050660  022701  052525                  CMP     #52525,%0!1             ;IS THE RESULT 52525?
050664  001403                          BEQ     .+10
050666                          1$:
050666  004767  007634                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050672  000137                          137                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

050674  021527  000215                  CMP     (R5),#215                       ;IS THE $TESTN = #215?
050700  001372                          BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
050702  005215                          INC     (R5)
```

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

050704  010767  127262             TST216: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
050710  012700  125252                     MOV     #125252,%0                  ;LOAD R0 WITH 125252
050714  012701  125252                     MOV     #125252,%0!1        ;LOAD R0!1 WITH 125252
050720  000241                             CLC
050722  073034                             ASHC    @(4)+,%0                    ;SHIFT R0,R0!1 BY @(4)+
050724  106737  042142                     MFPS    @#PSWORD            ;SAVE PS
050730  122737  000010  042142             CMPB    #10,@#PSWORD        ;IS THE PS 10?
050736  001403                             BEQ     .+10
050740  004767  007562                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;THE PS IS NOT EQUAL TO 10
050744  000140                             140             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

050746  022700  177525                     CMP     #177525,%0          ;IS THE RESULT 177525?
050752  001403                             BEQ     .+10
050754  004767  007546                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;R0 IS NOT EQUAL TO 177525
050760  000141                             141             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

050762  022701  052525                     CMP     #52525,%0!1         ;IS THE RESULT 52525?
050766  001403                             BEQ     .+10
050770                             1$:
050770  004767  007532                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050774  000142                             142             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

050776  021527  000216                     CMP     (R5),#216                   ;IS THE $TESTN = #216?
051002  001372                             BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
051004  005215                             INC     (R5)



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

051006  010767  127160             TST217: 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  073054                             ASHC    @-(4),%0                    ;SHIFT R0,R0!1 BY @-(4)
051026  106737  042142                     MFPS    @#PSWORD            ;SAVE PS
051032  122737  000010  042142             CMPB    #10,@#PSWORD        ;IS THE PS 10?
051040  001403                             BEQ     .+10
051042  004767  007460                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;THE PS IS NOT EQUAL TO 10
051046  000143                             143             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

051050  022700  177525                     CMP     #177525,%0          ;IS THE RESULT 177525?
051054  001403                             BEQ     .+10
```

```
051056 004767 007444           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;R0 IS NOT EQUAL TO 177525
051062 000144                   144                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                   ;BY  (013746  000172  000207)

051064 022701 052525           CMP     #52525,%0!1        ;IS THE RESULT 52525?
051070 001403                   BEQ     .+10
051072                  1$:
051072 004767 007430           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051076 000145                   145                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                   ;BY  (013746  000172  000207)

051100 021527 000217           CMP     (R5),#217                   ;IS THE $TESTN = #217?
051104 001372                   BNE     1$                 ;IF NOT THEN GO TO HLT ABOVE
051106 005215                   INC     (R5)
```

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




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

 051110  010767  127056                  TST220: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
 051114  012700  000001                          MOV     #1,%0                   ;LOAD MULTIPLICAND WITH 1
 051120  070027  000000                          MUL     #0,%0                   ;MULTIPLY 1 * #0
 051124  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
 051130  122737  000004  042142                  CMPB    #4,@#PSWORD             ;IS PS = 4
 051136  001403                                  BEQ     .+10
 051140  004767  007362                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;PS IS WRONG
 051144  000146                                  146             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

 051146  022700  000000                          CMP     #0,%0                   ;IS HIGH ORDER = 0
 051152  001403                                  BEQ     .+10
 051154  004767  007346                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;HIGH ORDER IS WRONG
 051160  000147                                  147             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

 051162  022701  000000                          CMP     #0,%0!1                 ;IS LOW ORDER = 0
 051166  001403                                  BEQ     .+10
 051170                                  1$:
 051170  004767  007332                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;LOW ORDER IS WRONG OR WRONG SEQUENCE
 051174  000150                                  150             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

 051176  021527  000220                          CMP     (R5),#220
 051202  001372                                  BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
 051204  005215                                  INC     (R5)

```

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

051206  010767  126760                  TST221: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051212  012700  177777                          MOV     #-1,%0          ;LOAD MULTIPLICAND WITH -1
051216  070027  000001                          MUL     #1,%0           ;MULTIPLY -1 * #1
051222  106737  042142                          MFPS    @#PSWORD        ;SAVE PS
051226  122737  000010  042142                  CMPB    #10,@#PSWORD    ;IS PS = 10
051234  001403                                  BEQ     .+10
051236  004767  007264                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
051242  000151                                  151             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051244  022700  177777                          CMP     #-1,%0          ;IS HIGH ORDER = -1
051250  001403                                  BEQ     .+10
051252  004767  007250                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
051256  000152                                  152             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051260  022701  177777                          CMP     #-1,%0!1        ;IS LOW ORDER = -1
051264  001403                                  BEQ     .+10
051266                                  1$:
051266  004767  007234                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051272  000153                                  153             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051274  021527  000221                          CMP     (R5),#221
051300  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051302  005215                                  INC     (R5)
```

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

051304  010767  126662             TST222: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
051310  012702  000002                     MOV     #2,%2               ;LOAD MULTIPLICAND WITH 2
051314  070227  000002                     MUL     #2,%2               ;MULTIPLY 2 * #2
051320  106737  042142                     MFPS    @#PSWORD            ;SAVE PS
051324  122737  000000  042142             CMPB    #0,@#PSWORD         ;IS PS = 0
051332  001403                             BEQ     .+10
051334  004767  007166                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;PS IS WRONG
051340  000154                             154             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

051342  022702  000000                     CMP     #0,%2               ;IS HIGH ORDER = 0
051346  001403                             BEQ     .+10
051350  004767  007152                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;HIGH ORDER IS WRONG
051354  000155                             155             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

051356  022703  000004                     CMP     #4,%2!1             ;IS LOW ORDER = 4
051362  001403                             BEQ     .+10
051364                             1$:
051364  004767  007136                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051370  000156                             156             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

051372  021527  000222                     CMP     (R5),#222
051376  001372                             BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051400  005215                             INC     (R5)
```

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

051402  010767  126564                TST223:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
051406  010501                                 MOV     R5,R1               ;SAVE R5
051410  012704  001000                         MOV     #1000,%4            ;LOAD MULTIPLICAND WITH 1000
051414  070427  000200                         MUL     #200,%4             ;MULTIPLY 1000 * #200
051420  106737  042142                         MFPS    @#PSWORD            ;SAVE PS
051424  122737  000001  042142                 CMPB    #1,@#PSWORD         ;IS PS = 1
051432  001403                                 BEQ     .+10
051434  004767  007066                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;PS IS WRONG
051440  000157                                 157              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051442  022704  000001                         CMP     #1,%4               ;IS HIGH ORDER = 1
051446  001403                                 BEQ     .+10
051450  004767  007052                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;HIGH ORDER IS WRONG
051454  000160                                 160              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051456  022705  000000                         CMP     #0,%4!1             ;IS LOW ORDER = 0
051462  001403                                 BEQ     .+10
051464                                1$:
051464  004767  007036                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051470  000161                                 161              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051472  021127  000223                         CMP     (R1),#223                     ;CHECK THE TEST NUMBER
051476  001372                                 BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051500  010105                                 MOV     R1,R5               ;RESTORE R5
051502  005215                                 INC     (R5)
```

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

051504  010767  126462                   TST224: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
051510  012700  000002                           MOV     #2,%0               ;LOAD MULTIPLICAND WITH 2
051514  070027  077777                           MUL     #77777,%0           ;MULTIPLY 2 * #77777
051520  106737  042142                           MFPS    @#PSWORD            ;SAVE PS
051524  122737  000001  042142                   CMPB    #1,@#PSWORD         ;IS PS = 1
051532  001403                                   BEQ     .+10
051534  004767  006766                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;PS IS WRONG
051540  000162                                   162              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

051542  022700  000000                           CMP     #0,%0               ;IS HIGH ORDER = 0
051546  001403                                   BEQ     .+10
051550  004767  006752                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;HIGH ORDER IS WRONG
051554  000163                                   163              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

051556  022701  177776                           CMP     #177776,%0!1        ;IS LOW ORDER = 177776
051562  001403                                   BEQ     .+10
051564                                   1$:
051564  004767  006736                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051570  000164                                   164              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

051572  021527  000224                           CMP     (R5),#224
051576  001372                                   BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051600  005215                                   INC     (R5)
```

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

051602  010767  126364           TST225: MOV    PC,LPADR          ;STORE ERROR LOOP ADDRESS
051606  012702  007777                   MOV    #7777,%2          ;LOAD MULTIPLICAND WITH 7777
051612  070227  000010                   MUL    #10,%2            ;MULTIPLY 7777 * #10
051616  106737  042142                   MFPS   @#PSWORD          ;SAVE PS
051622  122737  000000  042142           CMPB   #0,@#PSWORD       ;IS PS = 0
051630  001403                           BEQ    .+10
051632  004767  006670                   JSR    PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
051636  000165                           165            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051640  022702  000000                   CMP    #0,%2             ;IS HIGH ORDER = 0
051644  001403                           BEQ    .+10
051646  004767  006654                   JSR    PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;HIGH ORDER IS WRONG
051652  000166                           166            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051654  022703  077770                   CMP    #77770,%2!1       ;IS LOW ORDER = 77770
051660  001403                           BEQ    .+10
051662                           1$:
051662  004767  006640                   JSR    PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE .
051666  000167                           167            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051670  021527  000225                   CMP    (R5),#225
051674  001372                           BNE    1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051676  005215                           INC    (R5)
```

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

051700  010767  126266                  TST226: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
051704  010501                                  MOV     R5,R1                   ;SAVE R5
051706  012704  077777                          MOV     #77777,%4               ;LOAD MULTIPLICAND WITH 77777
051712  070427  077777                          MUL     #77777,%4               ;MULTIPLY 77777 * #77777
051716  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
051722  122737  000001  042142                  CMPB    #1,@#PSWORD             ;IS PS = 1
051730  001403                                  BEQ     .+10
051732  004767  006570                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
051736  000170                                  170                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

051740  022704  037777                          CMP     #37777,%4               ;IS HIGH ORDER = 37777
051744  001403                                  BEQ     .+10
051746  004767  006554                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;HIGH ORDER IS WRONG
051752  000171                                  171                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

051754  022705  000001                          CMP     #1,%4!1                 ;IS LOW ORDER = 1
051760  001403                                  BEQ     .+10
051762                                  1$:
051762  004767  006540                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051766  000172                                  172                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

051770  021127  000226                          CMP     (R1),#226                       ;CHECK THE TEST NUMBER
051774  001372                                  BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051776  010105                                  MOV     R1,R5                   ;RESTORE R5
052000  005215                                  INC     (R5)
```

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

052002  010767  126164                    TST227: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
052006  012702  177777                            MOV     #-1,%2                  ;LOAD MULTIPLICAND WITH -1
052012  070227  077777                            MUL     #77777,%2               ;MULTIPLY -1 * #77777
052016  106737  042142                            MFPS    @#PSWORD                ;SAVE PS
052022  122737  000010  042142                    CMPB    #10,@#PSWORD            ;IS PS = 10
052030  001403                                    BEQ     .+10
052032  004767  006470                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;PS IS WRONG
052036  000173                                    173               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

052040  022702  177777                            CMP     #-1,%2                  ;IS HIGH ORDER = -1
052044  001403                                    BEQ     .+10
052046  004767  006454                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;HIGH ORDER IS WRONG
052052  000174                                    174               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

052054  022703  100001                            CMP     #100001,%2!1            ;IS LOW ORDER = 100001
052060  001403                                    BEQ     .+10
052062                                    1$:
052062  004767  006440                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052066  000175                                    175               ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

052070  021527  000227                            CMP     (R5),#227
052074  001372                                    BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052076  005215                                    INC     (R5)
```

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

 052100  010767  126066                  TST230: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
 052104  012700  177776                          MOV     #-2,%0              ;LOAD MULTIPLICAND WITH -2
 052110  070027  077777                          MUL     #77777,%0           ;MULTIPLY -2 * #77777
 052114  106737  042142                          MFPS    @#PSWORD            ;SAVE PS
 052120  122737  000011  042142                  CMPB    #11,@#PSWORD        ;IS PS = 11
 052126  001403                                  BEQ     .+10
 052130  004767  006372                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;PS IS WRONG
 052134  000176                                  176                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                     ;BY  (013746  000172  000207)

 052136  022700  177777                          CMP     #-1,%0              ;IS HIGH ORDER = -1
 052142  001403                                  BEQ     .+10
 052144  004767  006356                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;HIGH ORDER IS WRONG
 052150  000177                                  177                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                     ;BY  (013746  000172  000207)

 052152  022701  000002                          CMP     #2,%0!1             ;IS LOW ORDER = 2
 052156  001403                                  BEQ     .+10
 052160                                  1$:
 052160  004767  006342                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;LOW ORDER IS WRONG OR WRONG SEQUENCE
 052164  000200                                  200                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                     ;BY  (013746  000172  000207)

 052166  021527  000230                          CMP     (R5),#230
 052172  001372                                  BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
 052174  005215                                  INC     (R5)

```

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

052176  010767  125770                  TST231: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
052202  012702  125252                          MOV     #125252,%2        ;LOAD MULTIPLICAND WITH 125252
052206  070227  000002                          MUL     #2,%2             ;MULTIPLY 125252 * #2
052212  106737  042142                          MFPS    @#PSWORD          ;SAVE PS
052216  122737  000011  042142                  CMPB    #11,@#PSWORD      ;IS PS = 11
052224  001403                                  BEQ     .+10
052226  004767  006274                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;PS IS WRONG
052232  000201                                  201             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052234  022702  177777                          CMP     #-1,%2            ;IS HIGH ORDER = -1
052240  001403                                  BEQ     .+10
052242  004767  006260                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;HIGH ORDER IS WRONG
052246  000202                                  202             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052250  022703  052524                          CMP     #52524,%2!1       ;IS LOW ORDER = 52524
052254  001403                                  BEQ     .+10
052256                                  1$:
052256  004767  006244                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052262  000203                                  203             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052264  021527  000231                          CMP     (R5),#231
052270  001372                                  BNE     1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052272  005215                                  INC     (R5)
```

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

052274  010767  125672                  TST232: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
052300  010501                                  MOV     R5,R1                   ;SAVE R5
052302  012704  125252                          MOV     #125252,%4              ;LOAD MULTIPLICAND WITH 125252
052306  070427  040000                          MUL     #40000,%4               ;MULTIPLY 125252 * #40000
052312  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
052316  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS PS = 11
052324  001403                                  BEQ     .+10
052326  004767  006174                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
052332  000204                                  204                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

052334  022704  165252                          CMP     #165252,%4              ;IS HIGH ORDER = 165252
052340  001403                                  BEQ     .+10
052342  004767  006160                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;HIGH ORDER IS WRONG
052346  000205                                  205                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

052350  022705  100000                          CMP     #100000,%4!1            ;IS LOW ORDER = 100000
052354  001403                                  BEQ     .+10
052356                                  1$:
052356  004767  006144                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052362  000206                                  206                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

052364  021127  000232                          CMP     (R1),#232                       ;CHECK THE TEST NUMBER
052370  001372                                  BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052372  010105                                  MOV     R1,R5                   ;RESTORE R5
052374  005215                                  INC     (R5)
```

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

 052376  010767  125570                 TST233: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
 052402  012700  107070                         MOV     #107070,%0              ;LOAD MULTIPLICAND WITH 107070
 052406  070027  107070                         MUL     #107070,%0              ;MULTIPLY 107070 * #107070
 052412  106737  042142                         MFPS    @#PSWORD                ;SAVE PS
 052416  122737  000001  042142                 CMPB    #1,@#PSWORD             ;IS PS = 1
 052424  001403                                 BEQ     .+10
 052426  004767  006074                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
 052432  000207                                 207             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

 052434  022700  031222                         CMP     #31222,%0               ;IS HIGH ORDER = 31222
 052440  001403                                 BEQ     .+10
 052442  004767  006060                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
 052446  000210                                 210             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

 052450  022701  026100                         CMP     #26100,%0!1             ;IS LOW ORDER = 26100
 052454  001403                                 BEQ     .+10
 052456                                 1$:
 052456  004767  006044                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
 052462  000211                                 211             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

 052464  021527  000233                         CMP     (R5),#233
 052470  001372                                 BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
 052472  005215                                 INC     (R5)
```

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

052474  010767  125472                  TST234: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
052500  012701  177777                          MOV     #-1,%1              ;LOAD MULTIPLICAND WITH -1
052504  070127  000001                          MUL     #1,%1               ;MULTIPLY -1 * #1
052510  106737  042142                          MFPS    @#PSWORD            ;SAVE PS
052514  122737  000010  042142                  CMPB    #10,@#PSWORD        ;IS PS = 10
052522  001403                                  BEQ     .+10
052524  004767  005776                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;PS IS WRONG
052530  000212                                  212             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052532  022701  177777                          CMP     #-1,%1              ;IS HIGH ORDER = -1
052536  001403                                  BEQ     .+10
052540  004767  005762                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;HIGH ORDER IS WRONG
052544  000213                                  213             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052546  022701  177777                          CMP     #-1,%1!1            ;IS LOW ORDER = -1
052552  001403                                  BEQ     .+10
052554                                  1$:
052554  004767  005746                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052560  000214                                  214             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052562  021527  000234                          CMP     (R5),#234
052566  001372                                  BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052570  005215                                  INC     (R5)
```

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

052572  010767  125374                  TST235: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052576  012703  177777                          MOV     #-1,%3          ;LOAD MULTIPLICAND WITH -1
052602  070327  000000                          MUL     #0,%3           ;MULTIPLY -1 * #0
052606  106737  042142                          MFPS    @#PSWORD        ;SAVE PS
052612  122737  000004  042142                  CMPB    #4,@#PSWORD     ;IS PS = 4
052620  001403                                  BEQ     .+10
052622  004767  005700                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
052626  000215                                  215             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052630  022703  000000                          CMP     #0,%3           ;IS HIGH ORDER = 0
052634  001403                                  BEQ     .+10
052636  004767  005664                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
052642  000216                                  216             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052644  022703  000000                          CMP     #0,%3!1         ;IS LOW ORDER = 0
052650  001403                                  BEQ     .+10
052652                                  1$:
052652  004767  005650                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052656  000217                                  217             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052660  021527  000235                          CMP     (R5),#235
052664  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052666  005215                                  INC     (R5)
```

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

052670  010767  125276                TST236: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
052674  010501                                MOV     R5,R1                ;SAVE R5
052676  012705  077777                        MOV     #77777,%5            ;LOAD MULTIPLICAND WITH 77777
052702  070527  100000                        MUL     #100000,%5           ;MULTIPLY 77777 * #100000
052706  106737  042142                        MFPS    @#PSWORD             ;SAVE PS
052712  122737  000011  042142                CMPB    #11,@#PSWORD         ;IS PS = 11
052720  001403                                BEQ     .+10
052722  004767  005600                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;PS IS WRONG
052726  000220                                220                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

052730  022705  100000                        CMP     #100000,%5           ;IS HIGH ORDER = 100000
052734  001403                                BEQ     .+10
052736  004767  005564                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;HIGH ORDER IS WRONG
052742  000221                                221                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

052744  022705  100000                        CMP     #100000,%5!1         ;IS LOW ORDER = 100000
052750  001403                                BEQ     .+10
052752                                1$:
052752  004767  005550                        JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                           ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052756  000222                                222                ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

052760  021127  000236                        CMP     (R1),#236                  ;CHECK THE TEST NUMBER
052764  001372                                BNE     1$                   ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052766  010105                                MOV     R1,R5                ;RESTORE R5
052770  005215                                INC     (R5)
```

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

052772  010767  125174                        TST237: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
052776  012701  177777                                MOV     #-1,%1              ;LOAD MULTIPLICAND WITH -1
053002  070127  077777                                MUL     #77777,%1           ;MULTIPLY -1 * #77777
053006  106737  042142                                MFPS    @#PSWORD            ;SAVE PS
053012  122737  000010  042142                        CMPB    #10,@#PSWORD        ;IS PS = 10
053020  001403                                        BEQ     .+10
053022  004767  005500                                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;PS IS WRONG
053026  000223                                        223               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

053030  022701  100001                                CMP     #100001,%1          ;IS HIGH ORDER = 100001
053034  001403                                        BEQ     .+10
053036  004767  005464                                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;HIGH ORDER IS WRONG
053042  000224                                        224               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

053044  022701  100001                                CMP     #100001,%1!1        ;IS LOW ORDER = 100001
053050  001403                                        BEQ     .+10
053052                                        1$:
053052  004767  005450                                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053056  000225                                        225               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

053060  021527  000237                                CMP     (R5),#237
053064  001372                                        BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053066  005215                                        INC     (R5)
```

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

053070  010767  125076               TST240: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
053074  012703  077777                       MOV     #77777,%3           ;LOAD MULTIPLICAND WITH 77777
053100  070327  077777                       MUL     #77777,%3           ;MULTIPLY 77777 * #77777
053104  106737  042142                       MFPS    @#PSWORD            ;SAVE PS
053110  122737  000001  042142               CMPB    #1,@#PSWORD         ;IS PS = 1
053116  001403                               BEQ     .+10
053120  004767  005402                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;PS IS WRONG
053124  000226                               226             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053126  022703  000001                       CMP     #1,%3               ;IS HIGH ORDER = 1
053132  001403                               BEQ     .+10
053134  004767  005366                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;HIGH ORDER IS WRONG
053140  000227                               227             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053142  022703  000001                       CMP     #1,%3!1             ;IS LOW ORDER = 1
053146  001403                               BEQ     .+10
053150                               1$:
053150  004767  005352                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053154  000230                               230             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053156  021527  000240                       CMP     (R5),#240
053162  001372                               BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053164  005215                               INC     (R5)
```

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

053166  010767  125000             TST241: MOV     PC,LPADR              ;STORE ERROR LOOP ADDRESS
053172  010501                             MOV     R5,R1                 ;SAVE R5
053174  012705  000002                     MOV     #2,%5                 ;LOAD MULTIPLICAND WITH 2
053200  070527  000002                     MUL     #2,%5                 ;MULTIPLY 2 * #2
053204  106737  042142                     MFPS    @#PSWORD              ;SAVE PS
053210  122737  000000  042142             CMPB    #0,@#PSWORD           ;IS PS = 0
053216  001403                             BEQ     .+10
053220  004767  005302                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;PS IS WRONG
053224  000231                             231               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053226  022705  000004                     CMP     #4,%5                 ;IS HIGH ORDER = 4
053232  001403                             BEQ     .+10
053234  004767  005266                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;HIGH ORDER IS WRONG
053240  000232                             232               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053242  022705  000004                     CMP     #4,%5!1               ;IS LOW ORDER = 4
053246  001403                             BEQ     .+10
053250                             1$:
053250  004767  005252                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053254  000233                             233               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053256  021127  000241                     CMP     (R1),#241                       ;CHECK THE TEST NUMBER
053262  001372                             BNE     1$                    ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053264  010105                             MOV     R1,R5                 ;RESTORE R5
053266  005215                             INC     (R5)
```

```
053270  012702  040000                    MOV     #40000,%2
053274  012703  042174                    MOV     #S5,%3
053300  012704  042176                    MOV     #S6,%4

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

053304  010767  124662            TST242: MOV     PC,LPADR              ;STORE ERROR LOOP ADDRESS
053310  012700  125252                    MOV     #125252,%0            ;LOAD MULTIPLICAND WITH 125252
053314  070067  166654                    MUL     S5,%0                 ;MULTIPLY 125252 * S5
053320  106737  042142                    MFPS    @#PSWORD              ;SAVE PS
053324  122737  000011  042142            CMPB    #11,@#PSWORD          ;IS PS = 11
053332  001403                            BEQ     .+10
053334  004767  005166                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
053340  000234                            234             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

053342  022700  165252                    CMP     #165252,%0            ;IS HIGH ORDER = 165252
053346  001403                            BEQ     .+10
053350  004767  005152                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
053354  000235                            235             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

053356  022701  100000                    CMP     #100000,%0!1          ;IS LOW ORDER = 100000
053362  001403                            BEQ     .+10
053364                            1$:
053364  004767  005136                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053370  000236                            236             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

053372  021527  000242                    CMP     (R5),#242
053376  001372                            BNE     1$                    ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053400  005215                            INC     (R5)
```

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

053402  010767  124564                  TST243: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
053406  012700  125252                          MOV     #125252,%0          ;LOAD MULTIPLICAND WITH 125252
053412  070077  166560                          MUL     @S6,%0              ;MULTIPLY 125252 * @S6
053416  106737  042142                          MFPS    @#PSWORD            ;SAVE PS
053422  122737  000011  042142                  CMPB    #11,@#PSWORD        ;IS PS = 11
053430  001403                                  BEQ     .+10
053432  004767  005070                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;PS IS WRONG
053436  000237                                  237             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053440  022700  165252                          CMP     #165252,%0          ;IS HIGH ORDER = 165252
053444  001403                                  BEQ     .+10
053446  004767  005054                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;HIGH ORDER IS WRONG
053452  000240                                  240             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053454  022701  100000                          CMP     #100000,%0!1        ;IS LOW ORDER = 100000
053460  001403                                  BEQ     .+10
053462                                  1$:
053462  004767  005040                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053466  000241                                  241             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053470  021527  000243                          CMP     (R5),#243
053474  001372                                  BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053476  005215                                  INC     (R5)
```

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

053500  010767  124466              TST244: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
053504  012700  125252                      MOV     #125252,%0           ;LOAD MULTIPLICAND WITH 125252
053510  070037  042174                      MUL     @#S5,%0              ;MULTIPLY 125252 * @#S5
053514  106737  042142                      MFPS    @#PSWORD             ;SAVE PS
053520  122737  000011  042142              CMPB    #11,@#PSWORD         ;IS PS = 11
053526  001403                              BEQ     .+10
053530  004767  004772                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;PS IS WRONG
053534  000242                              242              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053536  022700  165252                      CMP     #165252,%0           ;IS HIGH ORDER = 165252
053542  001403                              BEQ     .+10
053544  004767  004756                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;HIGH ORDER IS WRONG
053550  000243                              243              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053552  022701  100000                      CMP     #100000,%0!1         ;IS LOW ORDER = 100000
053556  001403                              BEQ     .+10
053560                              1$:
053560  004767  004742                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053564  000244                              244              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

053566  021527  000244                      CMP     (R5),#244
053572  001372                              BNE     1$                   ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVF
053574  005215                              INC     (R5)
```

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

053576  010767  124370            TST245: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
053602  012700  125252                    MOV     #125252,%0           ;LOAD MULTIPLICAND WITH 125252
053606  070002                            MUL     %2,%0                ;MULTIPLY 125252 * %2
053610  106737  042142                    MFPS    @#PSWORD             ;SAVE PS
053614  122737  000011  042142            CMPB    #11,@#PSWORD         ;IS PS = 11
053622  001403                            BEQ     .+10
053624  004767  004676                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;PS IS WRONG
053630  000245                            245             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

053632  022700  165252                    CMP     #165252,%0           ;IS HIGH ORDER = 165252
053636  001403                            BEQ     .+10
053640  004767  004662                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;HIGH ORDER IS WRONG
053644  000246                            246             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

053646  022701  100000                    CMP     #100000,%0!1         ;IS LOW ORDER = 100000
053652  001403                            BEQ     .+10
053654                            1$:
053654  004767  004646                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                               ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053660  000247                            247             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

053662  021527  000245                    CMP     (R5),#245
053666  001372                            BNE     1$                   ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053670  005215                            INC     (R5)
```

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

053672  010767  124274            TST246: MOV   PC,LPADR          ;STORE ERROR LOOP ADDRESS
053676  012700  125252                    MOV   #125252,%0        ;LOAD MULTIPLICAND WITH 125252
053702  070023                            MUL   (3)+,%0           ;MULTIPLY 125252 * (3)+
053704  106737  042142                    MFPS  @#PSWORD          ;SAVE PS
053710  122737  000011  042142            CMPB  #11,@#PSWORD      ;IS PS = 11
053716  001403                            BEQ   .+10
053720  004767  004602                    JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
053724  000250                            250           ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053726  022700  165252                    CMP   #165252,%0        ;IS HIGH ORDER = 165252
053732  001403                            BEQ   .+10
053734  004767  004566                    JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;HIGH ORDER IS WRONG
053740  000251                            251           ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053742  022701  100000                    CMP   #100000,%0!1      ;IS LOW ORDER = 100000
053746  001403                            BEQ   .+10
053750                            1$:
053750  004767  004552                    JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053754  000252                            252           ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053756  021527  000246                    CMP   (R5),#246
053762  001372                            BNE   1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053764  005215                            INC   (R5)
```

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

053766  010767  124200                  TST247: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
053772  012700  125252                          MOV     #125252,%0              ;LOAD MULTIPLICAND WITH 125252
053776  070043                                  MUL     -(3),%0                 ;MULTIPLY 125252 * -(3)
054000  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
054004  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS PS = 11
054012  001403                                  BEQ     .+10
054014  004767  004506                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
054020  000253                                  253                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

054022  022700  165252                          CMP     #165252,%0              ;IS HIGH ORDER = 165252
054026  001403                                  BEQ     .+10
054030  004767  004472                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;HIGH ORDER IS WRONG
054034  000254                                  254                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

054036  022701  100000                          CMP     #100000,%0!1            ;IS LOW ORDER = 100000
054042  001403                                  BEQ     .+10
054044                                  1$:
054044  004767  004456                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054050  000255                                  255                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

054052  021527  000247                          CMP     (R5),#247
054056  001372                                  BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054060  005215                                  INC     (R5)
```

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

054062  010767  124104                    TST250: MOV     PC,LPADR                 ;STORE ERROR LOOP ADDRESS
054066  012700  125252                            MOV     #125252,%0               ;LOAD MULTIPLICAND WITH 125252
054072  070064  000002                            MUL     2(4),%0                  ;MULTIPLY 125252 * 2(4)
054076  106737  042142                            MFPS    @#PSWORD                 ;SAVE PS
054102  122737  000011  042142                    CMPB    #11,@#PSWORD             ;IS PS = 11
054110  001403                                    BEQ     .+10
054112  004767  004410                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                   ;PS IS WRONG
054116  000256                                    256                    ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                         ;BY  (013746  000172  000207)

054120  022700  165252                            CMP     #165252,%0               ;IS HIGH ORDER = 165252
054124  001403                                    BEQ     .+10
054126  004767  004374                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                   ;HIGH ORDER IS WRONG
054132  000257                                    257                    ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                         ;BY  (013746  000172  000207)

054134  022701  100000                            CMP     #100000,%0!1             ;IS LOW ORDER = 100000
054140  001403                                    BEQ     .+10
054142                                    1$:
054142  004767  004360                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                   ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054146  000260                                    260                    ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                         ;BY  (013746  000172  000207)

054150  021527  000250                            CMP     (R5),#250
054154  001372                                    BNE     1$                       ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054156  005215                                    INC     (R5)
```

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

054160  010767  124006                   TST251: MOV     PC,LPADR              ;STORE ERROR LOOP ADDRESS
054164  012700  125252                           MOV     #125252,%0            ;LOAD MULTIPLICAND WITH 125252
054170  070074  000000                           MUL     @(4),%0               ;MULTIPLY 125252 * @(4)
054174  106737  042142                           MFPS    @#PSWORD              ;SAVE PS
054200  122737  000011  042142                   CMPB    #11,@#PSWORD          ;IS PS = 11
054206  001403                                   BEQ     .+10
054210  004767  004312                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;PS IS WRONG
054214  000261                                   261             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

054216  022700  165252                           CMP     #165252,%0            ;IS HIGH ORDER = 165252
054222  001403                                   BEQ     .+10
054224  004767  004276                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;HIGH ORDER IS WRONG
054230  000262                                   262             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

054232  022701  100000                           CMP     #100000,%0!1          ;IS LOW ORDER = 100000
054236  001403                                   BEQ     .+10
054240                                   1$:
054240  004767  004262                           JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054244  000263                                   263             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                 ;BY  (013746  000172  000207)

054246  021527  000251                           CMP     (R5),#251
054252  001372                                   BNE     1$                    ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054254  005215                                   INC     (R5)
```

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

054256  010767  123710                  TST252: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
054262  012700  125252                          MOV     #125252,%0              ;LOAD MULTIPLICAND WITH 125252
054266  070034                                  MUL     @(4)+,%0                ;MULTIPLY 125252 * @(4)+
054270  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
054274  122737  000011  042142                  CMPB    #11,@#PSWORD            ;IS PS = 11
054302  001403                                  BEQ     .+10
054304  004767  004216                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
054310  000264                                  264             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

054312  022700  165252                          CMP     #165252,%0              ;IS HIGH ORDER = 165252
054316  001403                                  BEQ     .+10
054320  004767  004202                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
054324  000265                                  265             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

054326  022701  100000                          CMP     #100000,%0!1            ;IS LOW ORDER = 100000
054332  001403                                  BEQ     .+10
054334                                  1$:
054334  004767  004166                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054340  000266                                  266             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

054342  021527  000252                          CMP     (R5),#252
054346  001372                                  BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054350  005215                                  INC     (R5)
```

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

054352  010767  123614                   TST253: MOV    PC,LPADR            ;STORE ERROR LOOP ADDRESS
054356  012700  125252                           MOV    #125252,%0          ;LOAD MULTIPLICAND WITH 125252
054362  070054                                   MUL    @-(4),%0            ;MULTIPLY 125252 * @-(4)
054364  106737  042142                           MFPS   @#PSWORD            ;SAVE PS
054370  122737  000011  042142                   CMPB   #11,@#PSWORD        ;IS PS = 11
054376  001403                                   BEQ    .+10
054400  004767  004122                           JSR    PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;PS IS WRONG
054404  000267                                   267                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

054406  022700  165252                           CMP    #165252,%0          ;IS HIGH ORDER = 165252
054412  001403                                   BEQ    .+10
054414  004767  004106                           JSR    PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;HIGH ORDER IS WRONG
054420  000270                                   270                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

054422  022701  100000                           CMP    #100000,%0!1        ;IS LOW ORDER = 100000
054426  001403                                   BEQ    .+10
054430                                   1$:
054430  004767  004072                           JSR    PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054434  000271                                   271                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

054436  021527  000253                           CMP    (R5),#253
054442  001372                                   BNE    1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054444  005215                                   INC    (R5)
```

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



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

054446  010767  123520                     TST254: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
054452  012700  000000                             MOV     #0,%0                ;LOAD HIGH ORDER WITH 0
054456  012701  000004                             MOV     #4,%0+1              ;LOAD LOW ORDER WITH 4
054462  071027  000002                             DIV     #2,%0                ;DIVIDE BY #2
054466  106737  042142                             MFPS    @#PSWORD             ;SAVE PS

054472  122737  000000  042142                     CMPB    #0,@#PSWORD          ;IS PS = 0
054500  001403                                     BEQ     .+10
054502  004767  004020                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
054506  000272                                     272              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)


054510  022700  000002                             CMP     #2,%0                ;IS QUOTIENT = 2
054514  001403                                     BEQ     .+10
054516  004767  004004                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;QUOTIENT IS WRONG
054522  000273                                     273              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)


054524  022701  000000                             CMP     #0,%0+1              ;IS REMAINDER = 0
054530  001403                                     BEQ     .+10
054532  004767  003770                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;WRONG REMAINDER
054536  000274                                     274              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

054540  021527  000254                             CMP     (R5),#254
054544  001403                                     BEQ     .+10                 ;IF IN WRONG SEQUENCE GO TO THE HLT
054546  004767  003754                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
054552  000275                                     275              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

054554  005215                                     INC     (R5)
```

```
                                                ;*******************************************************************
                                                ;TEST:255        DIV      -1 -9. / #3 = -3        REM = 0       PS = 10
                                                ;*******************************************************************
 054556  010767  123410                 TST255: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
 054562  012702  177777                         MOV     #-1,%2                  ;LOAD HIGH ORDER WITH -1
 054566  012703  177767                         MOV     #-9.,%2+1               ;LOAD LOW ORDER WITH -9.
 054572  071227  000003                         DIV     #3,%2                   ;DIVIDE BY #3
 054576  106737  042142                         MFPS    @#PSWORD                ;SAVE PS
 054602  122737  000010  042142                 CMPB    #10,@#PSWORD            ;IS PS = 10
 054610  001403                                 BEQ     .+10
 054612  004767  003710                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
 054616  000276                                 276             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)
 054620  022702  177775                         CMP     #-3,%2                  ;IS QUOTIENT = -3
 054624  001403                                 BEQ     .+10
 054626  004767  003674                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
 054632  000277                                 277             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)
 054634  022703  000000                         CMP     #0,%2+1                 ;IS REMAINDER = 0
 054640  001403                                 BEQ     .+10
 054642  004767  003660                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
 054646  000300                                 300             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)
 054650  021527  000255                         CMP     (R5),#255
 054654  001403                                 BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
 054656  004767  003644                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
 054662  000301                                 301             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)
 054664  005215                                 INC     (R5)
```

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

054666  010767  123300                  TST256: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
054672  010501                                  MOV     R5,R1                   ;SAVE R5
054674  012704  000000                          MOV     #0,%4                   ;LOAD HIGH ORDER WITH 0
054700  012705  000011                          MOV     #9.,%4+1                ;LOAD LOW ORDER WITH 9.
054704  071427  000002                          DIV     #2,%4                   ;DIVIDE BY #2
054710  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

054714  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
054722  001403                                  BEQ     .+10
054724  004767  003576                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
054730  000302                                  302             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


054732  022704  000004                          CMP     #4,%4                   ;IS QUOTIENT = 4
054736  001403                                  BEQ     .+10
054740  004767  003562                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
054744  000303                                  303             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


054746  022705  000001                          CMP     #1,%4+1                 ;IS REMAINDER = 1
054752  001403                                  BEQ     .+10
054754  004767  003546                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
054760  000304                                  304             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

054762  010105                                  MOV     R1,R5                   ;RESTORE R5
054764  021527  000256                          CMP     (R5),#256
054770  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
054772  004767  003530                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
054776  000305                                  305             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

055000  005215                                  INC     (R5)
```

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

055002  010767  123164                    TST257: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
055006  012700  177777                            MOV     #-1,%0            ;LOAD HIGH ORDER WITH -1
055012  012701  177767                            MOV     #-9.,%0+1         ;LOAD LOW ORDER WITH -9.
055016  071027  000002                            DIV     #2,%0             ;DIVIDE BY #2
055022  106737  042142                            MFPS    @#PSWORD          ;SAVE PS

055026  122737  000010  042142                    CMPB    #10,@#PSWORD      ;IS PS = 10
055034  001403                                    BEQ     .+10
055036  004767  003464                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;PS IS WRONG
055042  000306                                    306             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)


055044  022700  177774                            CMP     #-4,%0            ;IS QUOTIENT = -4
055050  001403                                    BEQ     .+10
055052  004767  003450                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;QUOTIENT IS WRONG
055056  000307                                    307             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)


055060  022701  177777                            CMP     #-1,%0+1          ;IS REMAINDER = -1
055064  001403                                    BEQ     .+10
055066  004767  003434                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;WRONG REMAINDER
055072  000310                                    310             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

055074  021527  000257                            CMP     (R5),#257
055100  001403                                    BEQ     .+10              ;IF IN WRONG SEQUENCE GO TO THE HLT
055102  004767  003420                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;TEST IS IN WRONG SEQUENCE
055106  000311                                    311             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

055110  005215                                    INC     (R5)
```

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

055112  010767  123054                  TST260: MOV     PC,LPADR              ;STORE ERROR LOOP ADDRESS
055116  012702  000000                          MOV     #0,%2                 ;LOAD HIGH ORDER WITH 0
055122  012703  000002                          MOV     #2,%2+1               ;LOAD LOW ORDER WITH 2
055126  071227  177775                          DIV     #-3,%2                ;DIVIDE BY #-3
055132  106737  042142                          MFPS    @#PSWORD              ;SAVE PS

055136  122737  000004  042142                  CMPB    #4,@#PSWORD           ;IS PS = 4
055144  001403                                  BEQ     .+10
055146  004767  003354                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                      ;PS IS WRONG
055152  000312                                  312             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


055154  022702  000000                          CMP     #0,%2                 ;IS QUOTIENT = 0
055160  001403                                  BEQ     .+10
055162  004767  003340                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                      ;QUOTIENT IS WRONG
055166  000313                                  313             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


055170  022703  000002                          CMP     #2,%2+1               ;IS REMAINDER = 2
055174  001403                                  BEQ     .+10
055176  004767  003324                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                      ;WRONG REMAINDER
055202  000314                                  314             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

055204  021527  000260                          CMP     (R5),#260
055210  001403                                  BEQ     .+10                  ;IF IN WRONG SEQUENCE GO TO THE HLT
055212  004767  003310                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                      ;TEST IS IN WRONG SEQUENCE
055216  000315                                  315             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

055220  005215                                  INC     (R5)
```

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

055222  010767  122744                  TST261: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
055226  010501                                  MOV     R5,R1                   ;SAVE R5
055230  012704  177777                          MOV     #-1,%4                  ;LOAD HIGH ORDER WITH -1
055234  012705  177776                          MOV     #-2,%4+1                ;LOAD LOW ORDER WITH -2
055240  071427  000003                          DIV     #3,%4                   ;DIVIDE BY #3
055244  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

055250  122737  000004  042142                  CMPB    #4,@#PSWORD             ;IS PS = 4
055256  001403                                  BEQ     .+10
055260  004767  003242                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
055264  000316                                  316                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)



055266  022704  000000                          CMP     #0,%4                   ;IS QUOTIENT = 0
055272  001403                                  BEQ     .+10
055274  004767  003226                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;QUOTIENT IS WRONG
055300  000317                                  317                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)



055302  022705  177776                          CMP     #-2,%4+1                ;IS REMAINDER = -2
055306  001403                                  BEQ     .+10
055310  004767  003212                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;WRONG REMAINDER
055314  000320                                  320                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

055316  010105                                  MOV     R1,R5                   ;RESTORE R5
055320  021527  000261                          CMP     (R5),#261
055324  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
055326  004767  003174                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
055332  000321                                  321                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

055334  005215                                  INC     (R5)

```

```
                                        ;*********************************************************************
                                        ;TEST:262       DIV     -1 -1 / #1 = -1         REM = 0       PS = 10
                                        ;*********************************************************************

055336  010767  122630                  TST262: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
055342  012700  177777                          MOV     #-1,%0                  ;LOAD HIGH ORDER WITH -1
055346  012701  177777                          MOV     #-1,%0+1                ;LOAD LOW ORDER WITH -1
055352  071027  000001                          DIV     #1,%0                   ;DIVIDE BY #1
055356  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

055362  122737  000010  042142                  CMPB    #10,@#PSWORD            ;IS PS = 10
055370  001403                                  BEQ     .+10
055372  004767  003130                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
055376  000322                                  322                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)


055400  022700  177777                          CMP     #-1,%0                  ;IS QUOTIENT = -1
055404  001403                                  BEQ     .+10
055406  004767  003114                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;QUOTIENT IS WRONG
055412  000323                                  323                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)


055414  022701  000000                          CMP     #0,%0+1                 ;IS REMAINDER = 0
055420  001403                                  BEQ     .+10
055422  004767  003100                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;WRONG REMAINDER
055426  000324                                  324                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

055430  021527  000262                          CMP     (R5),#262
055434  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
055436  004767  003064                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
055442  000325                                  325                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                        ;BY  (013746  000172  000207)

055444  005215                                  INC     (R5)
```

```
                                       ;*******************************************************************
                                       ;TEST:263       DIV     0 0 / #1 = 0        REM = 0       PS = 4
                                       ;*******************************************************************
055446  010767  122520                 TST263: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
055452  012700  000000                         MOV     #0,%0             ;LOAD HIGH ORDER WITH 0
055456  012701  000000                         MOV     #0,%0+1           ;LOAD LOW ORDER WITH 0
055462  071027  000001                         DIV     #1,%0             ;DIVIDE BY #1
055466  106737  042142                         MFPS    @#PSWORD          ;SAVE PS
055472  122737  000004  042142                 CMPB    #4,@#PSWORD       ;IS PS = 4
055500  001403                                 BEQ     .+10
055502  004767  003020                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;PS IS WRONG
055506  000326                                 326             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)
055510  022700  000000                         CMP     #0,%0             ;IS QUOTIENT = 0
055514  001403                                 BEQ     .+10
055516  004767  003004                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;QUOTIENT IS WRONG
055522  000327                                 327             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)
055524  022701  000000                         CMP     #0,%0+1           ;IS REMAINDER = 0
055530  001403                                 BEQ     .+10
055532  004767  002770                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;WRONG REMAINDER
055536  000330                                 330             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)
055540  021527  000263                         CMP     (R5),#263
055544  001403                                 BEQ     .+10              ;IF IN WRONG SEQUENCE GO TO THE HLT
055546  004767  002754                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                         ;TEST IS IN WRONG SEQUENCE
055552  000331                                 331             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                               ;BY  (013746  000172  000207)
055554  005215                                 INC     (R5)
```

```
                                          ;*******************************************************************************
                                          ;TEST:264        DIV     -1 125252 / #2 = 152525        REM = 0        PS = 10
                                          ;*******************************************************************************

055556  010767  122410                    TST264: MOV     PC,LPADR               ;STORE ERROR LOOP ADDRESS
055562  012702  177777                            MOV     #-1,%2                 ;LOAD HIGH ORDER WITH -1
055566  012703  125252                            MOV     #125252,%2+1           ;LOAD LOW ORDER WITH 125252
055572  071227  000002                            DIV     #2,%2                  ;DIVIDE BY #2
055576  106737  042142                            MFPS    @#PSWORD               ;SAVE PS

055602  122737  000010  042142                    CMPB    #10,@#PSWORD           ;IS PS = 10
055610  001403                                    BEQ     .+10
055612  004767  002710                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;PS IS WRONG
055616  000332                                    332             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)


055620  022702  152525                            CMP     #152525,%2             ;IS QUOTIENT = 152525
055624  001403                                    BEQ     .+10
055626  004767  002674                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;QUOTIENT IS WRONG
055632  000333                                    333             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)


055634  022703  000000                            CMP     #0,%2+1                ;IS REMAINDER = 0
055640  001403                                    BEQ     .+10
055642  004767  002660                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;WRONG REMAINDER
055646  000334                                    334             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

055650  021527  000264                            CMP     (R5),#264
055654  001403                                    BEQ     .+10                   ;IF IN WRONG SEQUENCE GO TO THE HLT
055656  004767  002644                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                          ;TEST IS IN WRONG SEQUENCE
055662  000335                                    335             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                  ;BY  (013746  000172  000207)

055664  005215                                    INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:265       DIV     -1 -1 / #-1 = 1         REM = 0       PS = 0
                                        ;*************************************************************************

055666  010767  122300                  TST265: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055672  010501                                  MOV     R5,R1           ;SAVE R5
055674  012704  177777                          MOV     #-1,%4          ;LOAD HIGH ORDER WITH -1
055700  012705  177777                          MOV     #-1,%4+1        ;LOAD LOW ORDER WITH -1
055704  071427  177777                          DIV     #-1,%4          ;DIVIDE BY #-1
055710  106737  042142                          MFPS    @#PSWORD        ;SAVE PS

055714  122737  000000  042142                  CMPB    #0,@#PSWORD     ;IS PS = 0
055722  001403                                  BEQ     .+10
055724  004767  002576                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
055730  000336                                  336             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


055732  022704  000001                          CMP     #1,%4           ;IS QUOTIENT = 1
055736  001403                                  BEQ     .+10
055740  004767  002562                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
055744  000337                                  337             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


055746  022705  000000                          CMP     #0,%4+1         ;IS REMAINDER = 0
055752  001403                                  BEQ     .+10
055754  004767  002546                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
055760  000340                                  340             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

055762  010105                                  MOV     R1,R5           ;RESTORE R5
055764  021527  000265                          CMP     (R5),#265
055770  001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055772  004767  002530                          JSR     PC,$HLT,SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
055776  000341                                  341             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056000  005215                                  INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:266        DIV      25253 1 / #125252 = 100000        REM = 1       PS = 10
                                        ;*************************************************************************

056002  010767  122164                  TST266: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056006  012700  025253                          MOV     #25253,%0       ;LOAD HIGH ORDER WITH 25253
056012  012701  000001                          MOV     #1,%0+1         ;LOAD LOW ORDER WITH 1
056016  071027  125252                          DIV     #125252,%0      ;DIVIDE BY #125252
056022  106737  042142                          MFPS    @#PSWORD        ;SAVE PS

056026  122737  000010  042142                  CMPB    #10,@#PSWORD    ;IS PS = 10
056034  001403                                  BEQ     .+10
056036  004767  002464                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
056042  000342                                  342             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056044  022700  100000                          CMP     #100000,%0      ;IS QUOTIENT = 100000
056050  001403                                  BEQ     .+10
056052  004767  002450                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
056056  000343                                  343             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056060  022701  000001                          CMP     #1,%0+1         ;IS REMAINDER = 1
056064  001403                                  BEQ     .+10
056066  004767  002434                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
056072  000344                                  344             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056074  021527  000266                          CMP     (R5),#266
056100  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
056102  004767  002420                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
056106  000345                                  345             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056110  005215                                  INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:267       DIV     37777 77777 / #77777 = 77777       REM = 77776        PS = 0
                                        ;*******************************************************************

056112  010767  122054                  TST267: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056116  012702  037777                          MOV     #37777,%2               ;LOAD HIGH ORDER WITH 37777
056122  012703  077777                          MOV     #77777,%2+1             ;LOAD LOW ORDER WITH 77777
056126  071227  077777                          DIV     #77777,%2               ;DIVIDE BY #77777
056132  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

056136  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
056144  001403                                  BEQ     .+10
056146  004767  002354                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
056152  000346                                  346             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)



056154  022702  077777                          CMP     #77777,%2               ;IS QUOTIENT = 77777
056160  001403                                  BEQ     .+10
056162  004767  002340                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;QUOTIENT IS WRONG
056166  000347                                  347             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)



056170  022703  077776                          CMP     #77776,%2+1             ;IS REMAINDER = 77776
056174  001403                                  BEQ     .+10
056176  004767  002324                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;WRONG REMAINDER
056202  000350                                  350             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056204  021527  000267                          CMP     (R5),#267
056210  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
056212  004767  002310                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
056216  000351                                  351             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056220  005215                                  INC     (R5)
```

```
                                        ;*****************************************************************
                                        ;TEST:270       DIV     0 100000 / #2 = 40000        REM = 0       PS = 0
                                        ;*****************************************************************
056222  010767  121744                  TST270: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056226  010501                                  MOV     R5,R1           ;SAVE R5
056230  012704  000000                          MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
056234  012705  100000                          MOV     #100000,%4+1    ;LOAD LOW ORDER WITH 100000
056240  071427  000002                          DIV     #2,%4           ;DIVIDE BY #2
056244  106737  042142                          MFPS    @#PSWORD        ;SAVE PS
056250  122737  000000  042142                  CMPB    #0,@#PSWORD     ;IS PS = 0
056256  001403                                  BEQ     .+10
056260  004767  002242                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
056264  000352                                  352             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)
056266  022704  040000                          CMP     #40000,%4       ;IS QUOTIENT = 40000
056272  001403                                  BEQ     .+10
056274  004767  002226                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
056300  000353                                  353             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)
056302  022705  000000                          CMP     #0,%4+1         ;IS REMAINDER = 0
056306  001403                                  BEQ     .+10
056310  004767  002212                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
056314  000354                                  354             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)
056316  010105                                  MOV     R1,R5           ;RESTORE R5
056320  021527  000270                          CMP     (R5),#270
056324  001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056326  004767  002174                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
056332  000355                                  355             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)
056334  005215                                  INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:271       DIV     177777 77777 / #177776 = 40000        REM = 177777        PS = 0
                                        ;*************************************************************************

056336  010767  121630                  TST271: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056342  012700  177777                          MOV     #177777,%0              ;LOAD HIGH ORDER WITH 177777
056346  012701  077777                          MOV     #77777,%0+1             ;LOAD LOW ORDER WITH 77777
056352  071027  177776                          DIV     #177776,%0              ;DIVIDE BY #177776
056356  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

056362  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
056370  001403                                  BEQ     .+10
056372  004767  002130                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
056376  000356                                  356             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056400  022700  040000                          CMP     #40000,%0               ;IS QUOTIENT = 40000
056404  001403                                  BEQ     .+10
056406  004767  002114                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
056412  000357                                  357             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056414  022701  177777                          CMP     #177777,%0+1            ;IS REMAINDER = 177777
056420  001403                                  BEQ     .+10
056422  004767  002100                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
056426  000360                                  360             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056430  021527  000271                          CMP     (R5),#271
056434  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
056436  004767  002064                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
056442  000361                                  361             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056444  005215                                  INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:272       DIV      0 52525 / #52525 = 1        REM = 0       PS = 0
                                        ;*************************************************************************

056446  010767  121520                  TST272: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056452  012702  000000                          MOV     #0,%2                   ;LOAD HIGH ORDER WITH 0
056456  012703  052525                          MOV     #52525,%2+1             ;LOAD LOW ORDER WITH 52525
056462  071227  052525                          DIV     #52525,%2               ;DIVIDE BY #52525
056466  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

056472  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
056500  001403                                  BEQ     .+10
056502  004767  002020                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
056506  000362                                  362             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056510  022702  000001                          CMP     #1,%2                   ;IS QUOTIENT = 1
056514  001403                                  BEQ     .+10
056516  004767  002004                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
056522  000363                                  363             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056524  022703  000000                          CMP     #0,%2+1                 ;IS REMAINDER = 0
056530  001403                                  BEQ     .+10
056532  004767  001770                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
056536  000364                                  364             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056540  021527  000272                          CMP     (R5),#272
056544  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
056546  004767  001754                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
056552  000365                                  365             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056554  005215                                  INC     (R5)

```

```
                                        ;*************************************************************************
                                        ;TEST:273       DIV     0 77777 / #0 = DUMMY        REM = DUMMY        PS = 3
                                        ;*************************************************************************

056556  010767  121410                  TST273: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056562  010501                                  MOV     R5,R1                   ;SAVE R5
056564  012704  000000                          MOV     #0,%4                   ;LOAD HIGH ORDER WITH 0
056570  012705  077777                          MOV     #77777,%4+1             ;LOAD LOW ORDER WITH 77777
056574  071427  000000                          DIV     #0,%4                   ;DIVIDE BY #0
056600  106737  042142                          MFPS    @#PSWORD                ;SAVE PS
056604  042737  000014  042142                  BIC     #14,@#PSWORD

056612  122737  000003  042142                  CMPB    #3,@#PSWORD             ;IS PS = 3
056620  001403                                  BEQ     .+10
056622  004767  001700                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
056626  000366                                  366             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


056630  010105                                  MOV     R1,R5                   ;RESTORE R5
056632  021527  000273                          CMP     (R5),#273
056636  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
056640  004767  001662                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
056644  000367                                  367             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056646  005215                                  INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:274       DIV     77777 177777 / #2 = DUMMY        REM = DUMMY       PS = 2
                                        ;*************************************************************************

056650  010767  121316                  TST274: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056654  012700  077777                          MOV     #77777,%0       ;LOAD HIGH ORDER WITH 77777
056660  012701  177777                          MOV     #177777,%0+1    ;LOAD LOW ORDER WITH 177777
056664  071027  000002                          DIV     #2,%0           ;DIVIDE BY #2
056670  106737  042142                          MFPS    @#PSWORD        ;SAVE PS
056674  042737  000014  042142                  BIC     #14,@#PSWORD

056702  122737  000002  042142                  CMPB    #2,@#PSWORD     ;IS PS = 2
056710  001403                                  BEQ     .+10
056712  004767  001610                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
056716  000370                                  370             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)



056720  021527  000274                          CMP     (R5),#274
056724  001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056726  004767  001574                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
056732  000371                                  371             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

056734  005215                                  INC     (R5)

```

```
056736  012702  000002                  MOV     #2,%2
056742  012703  042204                  MOV     #S9,%3
056746  012704  042206                  MOV     #S10,%4

                                ;*************************************************************************
                                ;TEST:275       DIV     0 52525 / S9 = 25252        REM = 1        PS = 0
                                ;*************************************************************************

056752  010767  121214          TST275: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056756  012700  000000                  MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
056762  012701  052525                  MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
056766  071067  163212                  DIV     S9,%0                   ;DIVIDE BY S9
056772  106737  042142                  MFPS    @#PSWORD                ;SAVE PS

056776  122737  000000  042142          CMPB    #0,@#PSWORD             ;IS PS = 0
057004  001403                          BEQ     .+10
057006  004767  001514                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
057012  000372                          372             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057014  022700  025252                  CMP     #25252,%0               ;IS QUOTIENT = 25252
057020  001403                          BEQ     .+10
057022  004767  001500                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
057026  000373                          373             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057030  022701  000001                  CMP     #1,%0+1                 ;IS REMAINDER = 1
057034  001403                          BEQ     .+10
057036  004767  001464                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
057042  000374                          374             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057044  021527  000275                  CMP     (R5),#275
057050  001403                          BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
057052  004767  001450                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
057056  000375                          375             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057060  005215                          INC     (R5)

```

```
                                     ;*************************************************************************
                                     ;TEST:276       DIV     0 52525 / @S10 = 25252        REM = 1       PS = 0
                                     ;*************************************************************************

057062  010767  121104               TST276: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
057066  012700  000000                       MOV     #0,%0               ;LOAD HIGH ORDER WITH 0
057072  012701  052525                       MOV     #52525,%0+1         ;LOAD LOW ORDER WITH 52525
057076  071077  163104                       DIV     @S10,%0             ;DIVIDE BY @S10
057102  106737  042142                       MFPS    @#PSWORD            ;SAVE PS

057106  122737  000000  042142               CMPB    #0,@#PSWORD         ;IS PS = 0
057114  001403                               BEQ     .+10
057116  004767  001404                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;PS IS WRONG
057122  000376                               376             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)


057124  022700  025252                       CMP     #25252,%0           ;IS QUOTIENT = 25252
057130  001403                               BEQ     .+10
057132  004767  001370                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;QUOTIENT IS WRONG
057136  000377                               377             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)


057140  022701  000001                       CMP     #1,%0+1             ;IS REMAINDER = 1
057144  001403                               BEQ     .+10
057146  004767  001354                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;WRONG REMAINDER
057152  000400                               400             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

057154  021527  000276                       CMP     (R5),#276
057160  001403                               BEQ     .+10                ;IF IN WRONG SEQUENCE GO TO THE HLT
057162  004767  001340                       JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;TEST IS IN WRONG SEQUENCE
057166  000401                               401             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                             ;BY  (013746  000172  000207)

057170  005215                               INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:277        DIV      0 52525 / @#S9 = 25252          REM = 1       PS = 0
                                        ;*************************************************************************

057172  010767  120774                  TST277: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
057176  012700  000000                          MOV     #0,%0                ;LOAD HIGH ORDER WITH 0
057202  012701  052525                          MOV     #52525,%0+1          ;LOAD LOW ORDER WITH 52525
057206  071037  042204                          DIV     @#S9,%0              ;DIVIDE BY @#S9
057212  106737  042142                          MFPS    @#PSWORD             ;SAVE PS

057216  122737  000000  042142                  CMPB    #0,@#PSWORD          ;IS PS = 0
057224  001403                                  BEQ     .+10
057226  004767  001274                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;PS IS WRONG
057232  000402                                  402             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057234  022700  025252                          CMP     #25252,%0            ;IS QUOTIENT = 25252
057240  001403                                  BEQ     .+10
057242  004767  001260                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;QUOTIENT IS WRONG
057246  000403                                  403             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057250  022701  000001                          CMP     #1,%0+1              ;IS REMAINDER = 1
057254  001403                                  BEQ     .+10
057256  004767  001244                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;WRONG REMAINDER
057262  000404                                  404             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057264  021527  000277                          CMP     (R5),#277
057270  001403                                  BEQ     .+10                 ;IF IN WRONG SEQUENCE GO TO THE HLT
057272  004767  001230                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                             ;TEST IS IN WRONG SEQUENCE
057276  000405                                  405             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057300  005215                                  INC     (R5)

```

```
                                        ;*************************************************************************
                                        ;TEST:300       DIV     0 52525 / %2 = 25252        REM = 1        PS = 0
                                        ;*************************************************************************

057302  010767  120664                  TST300: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
057306  012700  000000                          MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
057312  012701  052525                          MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
057316  071002                                  DIV     %2,%0                   ;DIVIDE BY %2
057320  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

057324  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
057332  001403                                  BEQ     .+10
057334  004767  001166                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
057340  000406                                  406             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057342  022700  025252                          CMP     #25252,%0               ;IS QUOTIENT = 25252
057346  001403                                  BEQ     .+10
057350  004767  001152                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
057354  000407                                  407             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057356  022701  000001                          CMP     #1,%0+1                 ;IS REMAINDER = 1
057362  001403                                  BEQ     .+10
057364  004767  001136                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
057370  000410                                  410             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057372  021527  000300                          CMP     (R5),#300
057376  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
057400  004767  001122                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
057404  000411                                  411             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057406  005215                                  INC     (R5)
```

```
                                          ;*************************************************************************
                                          ;TEST:301      DIV     0 52525 / (3)+ = 25252        REM = 1      PS = 0
                                          ;*************************************************************************

057410  010767  120556                    TST301: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
057414  012700  000000                            MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
057420  012701  052525                            MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
057424  071023                                    DIV     (3)+,%0                 ;DIVIDE BY (3)+
057426  106737  042142                            MFPS    @#PSWORD                ;SAVE PS

057432  122737  000000  042142                    CMPB    #0,@#PSWORD             ;IS PS = 0
057440  001403                                    BEQ     .+10
057442  004767  001060                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;PS IS WRONG
057446  000412                                    412                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                          ;BY  (013746  000172  000207)



057450  022700  025252                            CMP     #25252,%0               ;IS QUOTIENT = 25252
057454  001403                                    BEQ     .+10
057456  004767  001044                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;QUOTIENT IS WRONG
057462  000413                                    413                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                          ;BY  (013746  000172  000207)


057464  022701  000001                            CMP     #1,%0+1                 ;IS REMAINDER = 1
057470  001403                                    BEQ     .+10
057472  004767  001030                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;WRONG REMAINDER
057476  000414                                    414                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                          ;BY  (013746  000172  000207)

057500  021527  000301                            CMP     (R5),#301
057504  001403                                    BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
057506  004767  001014                            JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                  ;TEST IS IN WRONG SEQUENCE
057512  000415                                    415                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                          ;BY  (013746  000172  000207)

057514  005215                                    INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:302       DIV     0 52525 / -(3) = 25252          REM = 1         PS = 0
                                        ;*************************************************************************

057516  010767  120450                  TST302: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
057522  012700  000000                          MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
057526  012701  052525                          MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
057532  071043                                  DIV     -(3),%0                 ;DIVIDE BY -(3)
057534  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

057540  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
057546  001403                                  BEQ     .+10
057550  004767  000752                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
057554  000416                                  416             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057556  022700  025252                          CMP     #25252,%0               ;IS QUOTIENT = 25252
057562  001403                                  BEQ     .+10
057564  004767  000736                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;QUOTIENT IS WRONG
057570  000417                                  417             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057572  022701  000001                          CMP     #1,%0+1                 ;IS REMAINDER = 1
057576  001403                                  BEQ     .+10
057600  004767  000722                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;WRONG REMAINDER
057604  000420                                  420             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057606  021527  000302                          CMP     (R5),#302
057612  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
057614  004767  000706                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
057620  000421                                  421             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057622  005215                                  INC     (R5)
```

```
                                        ;*********************************************************************
                                        ;TEST:303        DIV      0 52525 / 2(4) = 25252        REM = 1      PS = 0
                                        ;*********************************************************************

057624  010767  120342                  TST303: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
057630  012700  000000                          MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
057634  012701  052525                          MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
057640  071064  000002                          DIV     2(4),%0                 ;DIVIDE BY 2(4)
057644  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

057650  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
057656  001403                                  BEQ     .+10
057660  004767  000642                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
057664  000422                                  422             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057666  022700  025252                          CMP     #25252,%0               ;IS QUOTIENT = 25252
057672  001403                                  BEQ     .+10
057674  004767  000626                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
057700  000423                                  423             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057702  022701  000001                          CMP     #1,%0+1                 ;IS REMAINDER = 1
057706  001403                                  BEQ     .+10
057710  004767  000612                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
057714  000424                                  424             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057716  021527  000303                          CMP     (R5),#303
057722  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
057724  004767  000576                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
057730  000425                                  425             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

057732  005215                                  INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:304       DIV     0 52525 / @(4) = 25252       REM = 1      PS = 0
                                        ;*************************************************************************

057734  010767  120232                  TST304: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
057740  012700  000000                          MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
057744  012701  052525                          MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
057750  071074  000000                          DIV     @(4),%0                 ;DIVIDE BY @(4)
057754  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

057760  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
057766  001403                                  BEQ     .+10
057770  004767  000532                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
057774  000426                                  426             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


057776  022700  025252                          CMP     #25252,%0               ;IS QUOTIENT = 25252
060002  001403                                  BEQ     .+10
060004  004767  000516                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
060010  000427                                  427             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


060012  022701  000001                          CMP     #1,%0+1                 ;IS REMAINDER = 1
060016  001403                                  BEQ     .+10
060020  004767  000502                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;WRONG REMAINDER
060024  000430                                  430             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

060026  021527  000304                          CMP     (R5),#304
060032  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
060034  004767  000466                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
060040  000431                                  431             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

060042  005215                                  INC     (R5)
```

```
                                        ;*******************************************************************
                                        ;TEST:305        DIV     0 52525 / @(4)+ = 25252        REM = 1      PS = 0
                                        ;*******************************************************************

060044  010767  120122                  TST305: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
060050  012700  000000                          MOV     #0,%0               ;LOAD HIGH ORDER WITH 0
060054  012701  052525                          MOV     #52525,%0+1         ;LOAD LOW ORDER WITH 52525
060060  071034                                  DIV     @(4)+,%0            ;DIVIDE BY @(4)+
060062  106737  042142                          MFPS    @#PSWORD            ;SAVE PS

060066  122737  000000  042142                  CMPB    #0,@#PSWORD         ;IS PS = 0
060074  001403                                  BEQ     .+10
060076  004767  000424                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;PS IS WRONG
060102  000432                                  432                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)


060104  022700  025252                          CMP     #25252,%0           ;IS QUOTIENT = 25252
060110  001403                                  BEQ     .+10
060112  004767  000410                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;QUOTIENT IS WRONG
060116  000433                                  433                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)


060120  022701  000001                          CMP     #1,%0+1             ;IS REMAINDER = 1
060124  001403                                  BEQ     .+10
060126  004767  000374                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;WRONG REMAINDER
060132  000434                                  434                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

060134  021527  000305                          CMP     (R5),#305
060140  001403                                  BEQ     .+10                ;IF IN WRONG SEQUENCE GO TO THE HLT
060142  004767  000360                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                            ;TEST IS IN WRONG SEQUENCE
060146  000435                                  435                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

060150  005215                                  INC     (R5)

```

```
                                        ;*************************************************************************
                                        ;TEST:306        DIV      0 52525 / @-(4) = 25252        REM = 1       PS = 0
                                        ;*************************************************************************

060152  010767  120014                  TST306: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
060156  012700  000000                          MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
060162  012701  052525                          MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
060166  071054                                  DIV     @-(4),%0                ;DIVIDE BY @-(4)
060170  106737  042142                          MFPS    @#PSWORD                ;SAVE PS

060174  122737  000000  042142                  CMPB    #0,@#PSWORD             ;IS PS = 0
060202  001403                                  BEQ     .+10
060204  004767  000316                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
060210  000436                                  436             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


060212  022700  025252                          CMP     #25252,%0               ;IS QUOTIENT = 25252
060216  001403                                  BEQ     .+10
060220  004767  000302                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;QUOTIENT IS WRONG
060224  000437                                  437             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


060226  022701  000001                          CMP     #1,%0+1                 ;IS REMAINDER = 1
060232  001403                                  BEQ     .+10
060234  004767  000266                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;WRONG REMAINDER
060240  000440                                  440             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

060242  021527  000306                          CMP     (R5),#306
060246  001403                                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
060250  004767  000252                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;TEST IS IN WRONG SEQUENCE
060254  000441                                  441             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)


060256  005215                                  INC     (R5)

```

```
060260  013746  000004                      MOV     @#4,-(SP)          ;SAVE LOCATION 4 IN STACK
060264  012737  060300  000004              MOV     #1$,@#4            ;SET UP TIME OUT TRAP VECTOR
060272  012737  000001  164000              MOV     #1,@#164000        ;TURN OFF MULTI-TESTER
060300  012637  000004          1$:         MOV     (SP)+,@#4          ;RESTORE LOCATION 4
060304  005227  177777                      INC     #-1                ;TYPE ID. THE FIRST PASS
060310  001002                              BNE     SKPMSG             ;BRANCH AROUND AFTER THE FIRST PASS
060312  104401  060346                      TYPE    ,MSG1
060316  122767  000001  117774  SKPMSG:     CMPB    #APTENV,$ENV
060324  001433                              BEQ     $EOP
060326  005267  001752                      INC     PASSPT             ;SHOULD PRINT THIS PASS?
060332  022767  000017  001744              CMP     #17,PASSPT         ;DID 17-OCTAL PASSES YET?
060340  001422                              BEQ     BREOP              ;IF YES, BRANCH TO EOP
060342  000137  001024                      JMP     @#RESTRT           ;JUMP TO RESTART
060346  005015  045103  042113  MSG1:       .ASCIZ  <15><12>*CJKDB-B DCF11-AA CPU DIAG.*<15><12>
060354  026502  020102  041504
060362  030506  026461  040501
060370  041440  052520  042040
060376  040511  027107  005015
060404     000
        060406                  .EVEN
                                .SBTTL ** ROUTINES LIST **

060406  012767  177777  001670  BREOP:  MOV     #-1,PASSPT         ;RESET PASSPT

                                .SBTTL  END OF PASS ROUTINE

                                ;*****************************************************************************
                                ;*INCREMENT THE PASS NUMBER ($PASS)
                                ;*TYPE 'END PASS #XXXXX'' (WHERE XXXXX IS A DECIMAL NUMBER)
                                ;*IF THERES A MONITOR GO TO IT
                                ;*IF THERE ISN'T JUMP TO RESTRT

060414                          $EOP:
060414  000240                              SCOPE
060416  005267  117664                      INC     $PASS              ;;INCREMENT THE PASS NUMBER
060422  042767  100000  117656              BIC     #100000,$PASS      ;;DON'T ALLOW A NEG. NUMBER
060430  005327                              DEC     (PC)+              ;;LOOP?
060432  000001                  $EOPCT:     .WORD   1
060434  003022                              BGT     $DOAGN             ;;YES
060436  012737                              MOV     (PC)+,@(PC)+       ;;RESTORE COUNTER
060440  000001                  $ENDCT:     .WORD   1
060442  060432                              $EOPCT
060444  104401  060511                      TYPE    ,$ENDMG            ;;TYPE 'END PASS #''
060450  016746  117632                      MOV     $PASS,-(SP)        ;;SAVE $PASS FOR TYPEOUT
060454  104405                              TYPDS                      ;;GO TYPE--DECIMAL ASCII WITH SIGN
060456  104401  060506                      TYPE    ,$ENULL            ;;TYPE A NULL CHARACTER
060462  013700  000042          $GET42:     MOV     @#42,R0            ;;GET MONITOR ADDRESS
060466  001405                              BEQ     $DOAGN             ;;BRANCH IF NO MONITOR
060470  000005                              RESET                      ;;CLEAR THE WORLD
060472  004710                  $ENDAD:     JSR     PC,(R0)            ;;GO TO MONITOR
060474  000240                              NOP                        ;;SAVE ROOM
060476  000240                              NOP                        ;;FOR
060500  000240                              NOP                        ;;ACT11
060502                          $DOAGN:
060502  000137                              JMP     @(PC)+             ;;RETURN
060504  001024                  $RTNAD:     .WORD   RESTRT
```

```
060506     377     377     000   $ENULL: .BYTE   -1,-1,0          ;;NULL CHARACTER STRING
060511     015  042412  042116   $ENDMG: .ASCIZ  <15><12>/END PASS #/
060516  050040  051501  020123
060524  000043


                                 .SBTTL  HALT ROUTINE
```

```

                                          ;*      HALT ROUTINE
                                          ;*      ------------
                                          ;*
                                          ;*
                                          ;*      PROGRAM COMES HERE ON ENCOUNTERING ANY ERROR
                                          ;*

060526  017637  000000  000302  $HLT:   MOV     @(SP),@#$FATAL  ;PLACE THE ERROR NUMBER AT LOCATION $FATAL
060534  011637  060714                  MOV     (SP),@#CONTIN   ;SAVE ERROR NUMBER ADDRESS
060540  032777  020000  161444          BIT     #20000,@SWR     ;HAS THE OPERATOR ASKED TO SUPRESS ERROR TYPE OUTS
060546  001021                          BNE     6$
060550  104401  042224                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060554  104401  060654                  TYPE    ,MSGERR         ;INFORM ERROR
060560  104401  042224                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060564  013746  060714                  MOV     @#CONTIN,-(SP)  ;RETREIVE ERROR NUMBER ADDR
060570  162716  000004                  SUB     #4,(SP)         ;CALCULATE ERROR PC
060574  104402                          TYPOC                   ;TYPE PC
060576  104401  042224                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060602  013746  000302                  MOV     @#$FATAL,-(SP)  ;RETREIVE ERROR NUMBER
060606  104403                          TYPOS                   ;TYPE ERROR NUMBER
060610     003                          .BYTE   3
060611     000                          .BYTE   0
060612  105767  117502          6$:     TSTB    $ENV            ;IF WE ARE NOT UNDER APT. THEN GO TO
060616  001403                          BEQ     8$              ;8$
060620  005237  000300                  INC     @#$MSGTY        ;OTHERWISE INFORM APT. ABOUT SEEING THE ERROR
060624  000777                          BR      .               ;AND LOOP
060626  104401  042224          8$:     TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060632  005777  161354                  TST     @SWR    ;IS IT REQUIRED TO HALT ON ERROR ?
060636  100001                          BPL     10$             ;IF NOT THEN GO TO 10$
060640  000000                          HALT
060642  013746  060714          10$:    MOV     @#CONTIN,-(SP)  ;
060646  062716  000002                  ADD     #2,(SP)         ;CALCULATE RETURN ADDRESS
060652  000207                          RTS     PC              ;RETURN
060654  042440  051122  051117  MSGERR: .ASCIZ / ERROR!   PC, AND ERROR # ARE: /
060662  020041  020040  041520
060670  020054  047101  020104
060676  051105  047522  020122
060704  020043  051101  035105
060712  000040

                                        .EVEN
060714  000000                          CONTIN: .WORD 0

                                        .SBTTL  POWER FAIL ROUTINE
060716  012767  060726  117100  PWRDN:  MOV     #PWRUP,24
060724  000000                          HALT

060726  012767  060716  117070  PWRUP:  MOV     #PWRDN,24
060734  012706  001000                  MOV     #BUFF,SP
060740  132767  000040  117353          BITB    #40,$ENVM       ;WILL APT ALLOW PRINTING?
060746  001013                          BNE     PFRES           ;NO
060750  012700  061002                  MOV     #MSGPWF,R0      ;GET MSG ADDR.
060754  105737  177564          PWAIT:  TSTB    @#TPS           ;TTY READY
060760  100375                          BPL     PWAIT           ;NO WAIT
060762  112037  177566                  MOVB    (R0)+,@#TPB     ;PRINT CHARACTER
060766  001372                          BNE     PWAIT           ;NEXT IF NOT DONE.
```

```
060770  105737  177564           PWAIT1: TSTB    @#TPS
060774  100375                           BPL     PWAIT1
060776  000167  120022           PFRES:  JMP     RESTRT
061002  005015  047520  042527   MSGPWF: .ASCIZ  <15><12>.POWER FAILED!.
061010  020122  040506  046111
061016  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
                                 ;*

061022  105767  000261           $TYPE:  TSTB    $TPFLG                  ;;IS THERE A TERMINAL?
061026  100002                           BPL     1$                      ;;BR IF YES
061030  000000                           HALT                            ;;HALT HERE IF NO TERMINAL
061032  000430                           BR      3$                      ;;LEAVE
061034  010046                   1$:     MOV     R0,-(SP)                ;;SAVE R0
061036  017600  000002                   MOV     @2(SP),R0               ;;GET ADDRESS OF ASCIZ STRING
061042  122767  000001  117250           CMPB    #APTENV,$ENV            ;;RUNNING IN APT MODE
061050  001011                           BNE     62$                     ;;NO,GO CHECK FOR APT CONSOLE
061052  132767  000100  117241           BITB    #APTSPOOL,$ENVM         ;;SPOOL MESSAGE TO APT
061060  001405                           BEQ     62$                     ;;NO,GO CHECK FOR CONSOLE
061062  010067  000004                   MOV     R0,61$                  ;;SETUP MESSAGE ADDRESS FOR APT
061066  004767  000230                   JSR     PC,$ATY3                ;;SPOOL MESSAGE TO APT
061072  000000                   61$:    .WORD   0                       ;;MESSAGE ADDRESS
061074  132767  000040  117217   62$:    BITB    #APTCSUP,$ENVM          ;;APT CONSOLE SUPPRESSED
061102  001003                           BNE     60$                     ;;YES,SKIP TYPE OUT
061104  112046                   2$:     MOVB    (R0)+,-(SP)             ;;PUSH CHARACTER TO BE TYPED ONTO STACK
061106  001005                           BNE     4$                      ;;BR IF IT ISN'T THE TERMINATOR
061110  005726                           TST     (SP)+                   ;;IF TERMINATOR POP IT OFF THE STACK
061112  012600                   60$:    MOV     (SP)+,R0                ;;RESTORE R0
061114  062716  000002           3$:     ADD     #2,(SP)                 ;;ADJUST RETURN PC
061120  000002                           RTI                             ;;RETURN
061122  122716  000011           4$:     CMPB    #HT,(SP)                ;;BRANCH IF <HT>
061126  001430                           BEQ     8$
061130  122716  000200                   CMPB    #CRLF,(SP)              ;;BRANCH IF NOT <CRLF>
061134  001006                           BNE     5$
061136  005726                           TST     (SP)+                   ;;POP  <CR><LF> EQUIV
061140  104401                           TYPE                            ;;TYPE A CR AND LF
061142  042224                           $CRLF
061144  105067  000130                   CLRB    $CHARCNT                ;;CLEAR CHARACTER COUNT
061150  000755                           BR      2$                      ;;GET NEXT CHARACTER
061152  004767  000056           5$:     JSR     PC,$TYPEC               ;;GO TYPE THIS CHARACTER
061156  126726  000124           6$:     CMPB    $FILLC,(SP)+            ;;IS IT TIME FOR FILLER CHARS.?
```

```
061162  001350                          BNE     2$                  ;;IF NO GO GET NEXT CHAR.
061164  016746  000114                  MOV     $NULL,-(SP)         ;;GET # OF FILLER CHARS. NEEDED
                                                                    ;;AND THE NULL CHAR.
061170  105366  000001          7$:     DECB    1(SP)               ;;DOES A NULL NEED TO BE TYPED?
061174  002770                          BLT     6$                  ;;BR IF NO--GO POP THE NULL OFF OF STACK
061176  004767  000032                  JSR     PC,$TYPEC           ;;GO TYPE A NULL
061202  105367  000072                  DECB    $CHARCNT            ;;DO NOT COUNT AS A COUNT
061206  000770                          BR      7$                  ;;LOOP

                                ;HORIZONTAL TAB PROCESSOR

061210  112716  000040          8$:     MOVB    #' ,(SP)            ;;REPLACE TAB WITH SPACE
061214  004767  000014          9$:     JSR     PC,$TYPEC           ;;TYPE A SPACE
061220  132767  000007  000052          BITB    #7,$CHARCNT         ;;BRANCH IF NOT AT
061226  001372                          BNE     9$                  ;;TAB STOP
061230  005726                          TST     (SP)+               ;;POP SPACE OFF STACK
061232  000724                          BR      2$                  ;;GET NEXT CHARACTER
061234  105777  160762          $TYPEC: TSTB    @$TPS               ;;WAIT UNTIL PRINTER IS READY
061240  100375                          BPL     $TYPEC
061242  116677  000002  160750          MOVB    2(SP),@$TPB         ;;LOAD CHAR TO BE TYPED INTO DATA REG.
061250  122766  000015  000002          CMPB    #CR,2(SP)           ;;IS CHARACTER A CARRIAGE RETURN?
061256  001003                          BNE     1$                  ;;BRANCH IF NO
061260  105067  000014                  CLRB    $CHARCNT            ;;YES--CLEAR CHARACTER COUNT
061264  000406                          BR      $TYPEX              ;;EXIT
061266  122766  000012  000002  1$:     CMPB    #LF,2(SP)           ;;IS CHARACTER A LINE FEED?
061274  001402                          BEQ     $TYPEX              ;;BRANCH IF YES
061276  105227                          INCB    (PC)+               ;;COUNT THE CHARACTER
061300  000000                  $CHARCNT:.WORD  0                   ;;CHARACTER COUNT STORAGE
061302  000207                  $TYPEX: RTS     PC

061304     000                  $NULL:  .BYTE   0                   ;;CONTAINS NULL CHARACTER FOR FILLS
061305     002                  $FILLS: .BYTE   2                   ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
061306     012                  $FILLC: .BYTE   12                  ;;INSERT FILL CHARS. AFTER A "LINE FEED"
061307     000                  $TPFLG: .BYTE   0                   ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
061310     077                  $QUES:  .ASCII  "?"                 ;;QUESTION MARK
061311     012     000          $LF:    .ASCIZ  <12>                ;;LINEFEED
        061314                          .EVEN
                                .SBTTL  APT COMMUNICATIONS ROUTINE

                                ;*********************************************************************************
061314  112767  000001  000236  $ATY1:  MOVB    #1,$FFLG            ;;TO REPORT FATAL ERROR
061322  112767  000001  000226  $ATY3:  MOVB    #1,$MFLG            ;;TO TYPE A MESSAGE
061330  000403                          BR      $ATYC
061332  112767  000001  000220  $ATY4:  MOVB    #1,$FFLG            ;;TO ONLY REPORT FATAL ERROR
061340                          $ATYC:
061340  010046                          MOV     R0,-(SP)            ;;PUSH R0 ON STACK
061342  010146                          MOV     R1,-(SP)            ;;PUSH R1 ON STACK
061344  105767  000206                  TSTB    $MFLG               ;;SHOULD TYPE A MESSAGE?
061350  001450                          BEQ     5$                  ;;IF NOT:  BR
061352  122767  000001  116740          CMPB    #APTENV,$ENV        ;;OPERATING UNDER APT?
061360  001031                          BNE     3$                  ;;IF NOT:  BR
061362  132767  000100  116731          BITB    #APTSPOOL,$ENVM     ;;SHOULD SPOOL MESSAGES?
061370  001425                          BEQ     3$                  ;;IF NOT:  BR
061372  017600  000004                  MOV     @4(SP),R0           ;;GET MESSAGE ADDR.
061376  062766  000002  000004          ADD     #2,4(SP)                    ;;BUMP RETURN ADDR.
061404  005767  116670          1$:     TST     $MSGTYPE            ;;SEE IF DONE W/ LAST XMISSION?
```

```
061410  001375                              BNE     1$              ;;IF NOT:  WAIT
061412  010067  116676                      MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
061416  105720                      2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
061420  001376                              BNE     2$
061422  166700  116666                      SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
061426  006200                              ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
061430  010067  116662                      MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
061434  012767  000004  116636              MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
061442  000413                              BR      5$
061444  017667  000004  000016      3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
061452  062766  000002  000004              ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
061460  016746  116312                      MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
061464  004767  177332                      JSR     PC,$TYPE        ;;CALL TYPE MACRO
061470  000000                      4$:     .WORD   0
061472                              5$:
061472  105767  000062              10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
061476  001416                              BEQ     12$             ;;IF NOT:  BR
061500  005767  116614                      TST     $ENV            ;;RUNNING UNDER APT?
061504  001413                              BEQ     12$             ;;IF NOT:  BR
061506  005767  116566              11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
061512  001375                              BNE     11$             ;;IF NOT:  WAIT
061514  017667  000004  116560              MOV     @4(SP),$FATAL   ;;GET ERROR #
061522  062766  000002  000004              ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
061530  005267  116544                      INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
061534  105067  000020              12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
061540  105067  000013                      CLRB    $LFLG           ;;CLEAR LOG FLAG
061544  105067  000006                      CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
061550  012601                              MOV     (SP)+,R1        ;;POP STACK INTO R1
061552  012600                              MOV     (SP)+,R0        ;;POP STACK INTO R0
061554  000207                              RTS     PC              ;;RETURN
061556     000                      $MFLG:  .BYTE   0               ;;MESSG. FLAG
061557     000                      $LFLG:  .BYTE   0               ;;LOG FLAG
061560     000                      $FFLG:  .BYTE   0               ;;FATAL FLAG
        061562                              .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

061562                              $TYPDS:
061562  010046                              MOV     R0,-(SP)        ;;PUSH R0 ON STACK
061564  010146                              MOV     R1,-(SP)        ;;PUSH R1 ON STACK
061566  010246                              MOV     R2,-(SP)        ;;PUSH R2 ON STACK
061570  010346                              MOV     R3,-(SP)        ;;PUSH R3 ON STACK
061572  010546                              MOV     R5,-(SP)        ;;PUSH R5 ON STACK
```

```
061574  012746  020200                    MOV     #20200,-(SP)     ;;SET BLANK SWITCH AND SIGN
061600  016605  000020                    MOV     20(SP),R5        ;;GET THE INPUT NUMBER
061604  100004                            BPL     1$               ;;BR IF INPUT IS POS.
061606  005405                            NEG     R5               ;;MAKE THE BINARY NUMBER POS.
061610  112766  000055  000001            MOVB    #'-,1(SP)        ;;MAKE THE ASCII NUMBER NEG.
061616  005000                    1$:     CLR     R0               ;;ZERO THE CONSTANTS INDEX
061620  012703  061776                    MOV     #$DBLK,R3        ;;SETUP THE OUTPUT POINTER
061624  112723  000040                    MOVB    #' ,(R3)+        ;;SET THE FIRST CHARACTER TO A BLANK
061630  005002                    2$:     CLR     R2               ;;CLEAR THE BCD NUMBER
061632  016001  061766                    MOV     $DTBL(R0),R1     ;;GET THE CONSTANT
061636  160105                    3$:     SUB     R1,R5            ;;FORM THIS BCD DIGIT
061640  002402                            BLT     4$               ;;BR IF DONE
061642  005202                            INC     R2               ;;INCREASE THE BCD DIGIT BY 1
061644  000774                            BR      3$
061646  060105                    4$:     ADD     R1,R5            ;;ADD BACK THE CONSTANT
061650  005702                            TST     R2               ;;CHECK IF BCD DIGIT=0
061652  001002                            BNE     5$               ;;FALL THROUGH IF 0
061654  105716                            TSTB    (SP)             ;;STILL DOING LEADING 0'S?
061656  100407                            BMI     7$               ;;BR IF YES
061660  106316                    5$:     ASLB    (SP)             ;;MSD?
061662  103003                            BCC     6$               ;;BR IF NO
061664  116663  000001  177777            MOVB    1(SP),-1(R3)     ;;YES--SET THE SIGN
061672  052702  000060            6$:     BIS     #'0,R2           ;;MAKE THE BCD DIGIT ASCII
061676  052702  000040            7$:     BIS     #' ,R2           ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
061702  110223                            MOVB    R2,(R3)+         ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
061704  005720                            TST     (R0)+            ;;JUST INCREMENTING
061706  020027  000010                    CMP     R0,#10           ;;CHECK THE TABLE INDEX
061712  002746                            BLT     2$               ;;GO DO THE NEXT DIGIT
061714  003002                            BGT     8$               ;;GO TO EXIT
061716  010502                            MOV     R5,R2            ;;GET THE LSD
061720  000764                            BR      6$               ;;GO CHANGE TO ASCII
061722  105726                    8$:     TSTB    (SP)+            ;;WAS THE LSD THE FIRST NON-ZERO?
061724  100003                            BPL     9$               ;;BR IF NO
061726  116663  177777  177776            MOVB    -1(SP),-2(R3)    ;;YES--SET THE SIGN FOR TYPING
061734  105013                    9$:     CLRB    (R3)             ;;SET THE TERMINATOR
061736  012605                            MOV     (SP)+,R5         ;;POP STACK INTO R5
061740  012603                            MOV     (SP)+,R3         ;;POP STACK INTO R3
061742  012602                            MOV     (SP)+,R2         ;;POP STACK INTO R2
061744  012601                            MOV     (SP)+,R1         ;;POP STACK INTO R1
061746  012600                            MOV     (SP)+,R0         ;;POP STACK INTO R0
061750  104401  061776                    TYPE    ,$DBLK           ;;NOW TYPE THE NUMBER
061754  016666  000002  000004            MOV     2(SP),4(SP)      ;;ADJUST THE STACK
061762  012616                            MOV     (SP)+,(SP)
061764  000002                            RTI                      ;;RETURN TO USER
061766  023420                    $DTBL:  10000.
061770  001750                            1000.
061772  000144                            100.
061774  000012                            10.
061776  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

062006  017646  000000                  $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
062012  116667  000001  000211                  MOVB    1(SP),$0FILL    ;;LOAD ZERO FILL SWITCH
062020  112667  000207                          MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
062024  062716  000002                          ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
062030  000406                                  BR      $TYPON
062032  112767  000001  000171          $TYPOC: MOVB    #1,$0FILL       ;;SET THE ZERO FILL SWITCH
062040  112767  000006  000165                  MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
062046  112767  000005  000154          $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
062054  010346                                  MOV     R3,-(SP)        ;;SAVE R3
062056  010446                                  MOV     R4,-(SP)        ;;SAVE R4
062060  010546                                  MOV     R5,-(SP)        ;;SAVE R5
062062  116704  000145                          MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
062066  005404                                  NEG     R4
062070  062704  000006                          ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
062074  110467  000132                          MOVB    R4,$OMODE       ;;SAVE IT FOR USE
062100  116704  000125                          MOVB    $0FILL,R4       ;;GET THE ZERO FILL SWITCH
062104  016605  000012                          MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
062110  005003                                  CLR     R3              ;;CLEAR THE OUTPUT WORD
062112  006105                          1$:     ROL     R5              ;;ROTATE MSB INTO ''C''
062114  000404                                  BR      3$              ;;GO DO MSB
062116  006105                          2$:     ROL     R5              ;;FORM THIS DIGIT
062120  006105                                  ROL     R5
062122  006105                                  ROL     R5
062124  010503                                  MOV     R5,R3
062126  006103                          3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
062130  105367  000076                          DECB    $OMODE          ;;TYPE THIS DIGIT?
062134  100016                                  BPL     7$              ;;BR IF NO
062136  042703  177770                          BIC     #177770,R3      ;;GET RID OF JUNK
062142  001002                                  BNE     4$              ;;TEST FOR 0
062144  005704                                  TST     R4              ;;SUPPRESS THIS 0?
062146  001403                                  BEQ     5$              ;;BR IF YES
062150  005204                          4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
062152  052703  000060                          BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
062156  052703  000040                  5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
062162  110367  000040                          MOVB    R3,8$           ;;SAVE FOR TYPING
062166  104401  062226                          TYPE    ,8$             ;;GO TYPE THIS DIGIT
062172  105367  000032                  7$:     DECB    $OCNT           ;;COUNT BY 1
062176  003347                                  BGT     2$              ;;BR IF MORE TO DO
```

```
062200  002402                          BLT     6$                      ;;BR IF DONE
062202  005204                          INC     R4                      ;;INSURE LAST DIGIT ISN'T A BLANK
062204  000744                          BR      2$                      ;;GO DO THE LAST DIGIT
062206  012605                  6$:     MOV     (SP)+,R5                ;;RESTORE R5
062210  012604                          MOV     (SP)+,R4                ;;RESTORE R4
062212  012603                          MOV     (SP)+,R3                ;;RESTORE R3
062214  016666  000002  000004          MOV     2(SP),4(SP)             ;;SET THE STACK FOR RETURNING
062222  012616                          MOV     (SP)+,(SP)
062224  000002                          RTI                             ;;RETURN
062226     000                  8$:     .BYTE   0                       ;;STORAGE FOR ASCII DIGIT
062227     000                          .BYTE   0                       ;;TERMINATOR FOR TYPE ROUTINE
062230     000                  $OCNT:  .BYTE   0                       ;;OCTAL DIGIT COUNTER
062231     000                  $OFILL: .BYTE   0                       ;;ZERO FILL SWITCH
062232  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.

062234  010046                  $TRAP:  MOV     R0,-(SP)                ;;SAVE R0
062236  016600  000002                  MOV     2(SP),R0                ;;GET TRAP ADDRESS
062242  005740                          TST     -(R0)                   ;;BACKUP BY 2
062244  111000                          MOVB    (R0),R0                 ;;GET RIGHT BYTE OF TRAP
062246  006300                          ASL     R0                      ;;POSITION FOR INDEXING
062250  016000  062270                  MOV     $TRPAD(R0),R0           ;;INDEX TO TABLE
062254  000200                          RTS     R0                      ;;GO TO ROUTINE


                                ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

062256  011646                  $TRAP2: MOV     (SP),-(SP)              ;;MOVE THE PC DOWN
062260  016666  000004  000002          MOV     4(SP),2(SP)             ;;MOVE THE PSW DOWN
062266  000002                          RTI                             ;;RESTORE THE PSW

                                .SBTTL  TRAP TABLE

                                ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                ;*BY THE "TRAP" INSTRUCTION.

                                ;       ROUTINE
                                ;       -------
062270  062256                  $TRPAD: .WORD   $TRAP2
062272  061022                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
062274  062032                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
062276  062006                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
062300  062046                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
062302  061562                          $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)


062304  177777                  PASSPT: -1
        000001                  .END
```

A	026054
ABASE =	000000
ACDW1 =	000000
ACDW2 =	000000
ACPUOP=	000000
ADC1	020374
ADC2	020404
ADC3	020424
ADC4	020434
ADC5	020452
ADDW0 =	000000
ADDW1 =	000000
ADDW10=	000000
ADDW11=	000000
ADDW12=	000000
ADDW13=	000000
ADDW14=	000000
ADDW15=	000000
ADDW2 =	000000
ADDW3 =	000000
ADDW4 =	000000
ADDW5 =	000000
ADDW6 =	000000
ADDW7 =	000000
ADDW8 =	000000
ADDW9 =	000000
ADD1	020210
ADD2	020220
ADD3	020234
ADD4	020244
ADD5	020262
ADD6	020272
ADD7	020304
ADD8	020314
ADD9	020334
ADEVCT=	000000
ADEVM =	000000
AENV =	000000
AENVM =	000000
AFATAL=	000000
AMADR1=	000000
AMADR2=	000000
AMADR3=	000000
AMADR4=	000000
AMAMS1=	000000
AMAMS2=	000000
AMAMS3=	000000
AMAMS4=	000000
AMSGAD=	000000
AMSGLG=	000000
AMSGTY=	000000
AMTYP1=	000000
AMTYP2=	000000
AMTYP3=	000000
AMTYP4=	000000
APASS =	000000
APRIOR=	000000
APTCSU=	000040
APTENV=	000001
APTSIZ=	000200
APTSPO=	000100
AROUN	025252
AROUND	041676
ASL1	021710
ASL2	021720
ASL3	021736
ASL4	021746
ASL5	021762
ASL6	021772
ASL7	022016
ASR1	022060
ASR2	022070
ASR3	022112
ASR4	022122
ASR5	022136
ASR6	022146
ASR7	022176
ASTART	042402
ASWREG=	000000
ATESTN=	000000
ATRAP	037502
AUNIT =	000000
AUSWR =	000000
AUTO1	037610
AVECT1=	000000
AVECT2=	000000
BELL =	000240
BIC1	017340
BIC2	017350
BIC3	017366
BIS1	017430
BIS2	017440
BIS3	017460
BITCHK	025442
BITCLR	025370
BITCON	025524
BITSET	025406
BIT1	017250
BIT2	017260
BIT3	017276
BRA1	001074
BRA2	001104
BRA3	001116
BRA4	001124
BRA5	001134
BRCT	025310
BRC1	003342
BRC2	003352
BRC3	003362
BREOP	060406
BRH	025262
BRMFPD	027074
BRN1	003222
BRN2	003232
BRN3	003242
BRTAB	027170
BRV1	003272
BRV2	003302
BRV3	003312
BRZ1	003152
BRZ2	003162
BRZ3	003172
BR1	027464
BR10	027700
BR11	030004
BR12	030052
BR13	030120
BR14	030166
BR15	030264
BR16	030304
BR17	030324
BR2	027512
BR20	030344
BR21	030364
BR22	030404
BR23	030424
BR3	027534
BR33	030474
BR34	030506
BR35	030520
BR36	030532
BR37	030554
BR4	027560
BR40	030566
BR41	030600
BR45	032126
BR46	032674
BR46A	032704
BR47	033464
BR5	027604
BR51	034232
BR51A	034242
BR6	027630
BR7	027654
BR70	037220
BR71	040150
BTCON	025600
BTERR	025564
BTRAP	037556
BUFF =	001000
CC =	177776
CCERR	026020
CC1	025256
CC2	025722
CC3	025706
CLRCD	025704
CLR1	017776
CMP1	020640
CMP2	020650
CMP3	020672
CMP4	020702
CMP5	020726
CMP6	020736
CMP7	020756
COM1	021016
CONT	025312
CONTIN	060714
CON1	025736
CON2	026030
CORH	037542
COUNT	042140
CPUTYP	041524
CR =	000015
CRLF =	000200
CTRAP	037520
DAERR	025514
DBE	041340
DBE1	041362
DBE2	041352
DBE3	041402
DBE4	041422
DBE5	041440
DEC1	017636
DEC2	017646
DEC3	017662
DEC4	017672
DEC5	017706
DEC6	017716
DEC7	017740
DISPLA	042214
DISPRE	000174
DL11W	037660
DL11W1	037664
DNMB0A	011036
DNMB0B	011046
DNMB2A	011274
DNMB2B	011304
DNMB2C	011320
DNMB2D	011334
DNMB2E	011344
DNMB2F	011362
DNMB3A	011444
DNMB3B	011454
DNMB3C	011472
DNMB3D	011510
DNMB3E	011520
DNMB4A	011710
DNMB4B	011720
DNMB4C	011736
DNMB4D	011746
DNMB4E	011756
DNMB4F	011772
DNM03A	010130
DNM03B	010140
DNM03C	010150
DNM1	010002
DNM1A	011114
DNM1B	011124
DNM2	010016
DNM2A	011172
DNM2B	011202
DNM2C	011210
DNM2D	011220
DNM3	010034
DNM4	010056
DNM4A	011602
DNM4B	011612
DNM4C	011626
DNM5A	012052
DNM5B	012062
DNM5C	012100
DNM6A	012160
DNM6B	012170
DNM6C	012206
DNM7A	012270
DNM7B	012300
DNM7C	012316
DOPB2A	010542
DOPB2B	010620
DOP0A	007544
DOP0B	007570
DOP0C	007610
DOP0D	007640
DOP03A	007716
DOP03B	007726
DOP1	010354
DOP2	010466
DOP4	013772
DOP5	014056
DTRAP1	037540
DUMMY =	000000
END1	027160
ENT176	046614
ENT51	044154
ER	025274

```
ERRNM = 000442
F     = 000063
FINISH  042124
FIRST =%000005
FOVER   036446
FPP     042114
GIN1    041716
GIN2    041734
GIN3    041762
HERE  = 000000
HICORE  037412
HLT   = 000000
HT    = 000011
IJMP    016354
IJMP4   016126
IJMP5   016316
ILLA  = 004700
ILLB  = 000100
INC1    017520
INC2    017530
INC3    017552
INC4    017562
INC5    017576
INST    042126
INSTC   030732
INSTK   035110
ITRAP5= 000004
JMPCK   016356
JMPERR  025634
JMPSEQ  016376
JMPT    025624
JMP2    016130
JMP2A   016146
JMP3    016056
JMP3A   016074
JMP3B   016114
JMP4    016160
JMP4A   016176
JMP4B   016216
JMP5    016264
JMP5A   016304
JMP6    016230
JMP6A   016250
JMP7    016320
JMP7A   016340
JSRCK   017030
JSRCKA  017024
JSRCK1  017046
JSRSEQ  017026
JSR0    016412
JSR1    016416
JSR1A   016440
JSR2    016530

JSR2A   016560
JSR2B   016570
JSR3    016450
JSR3A   016510
JSR3B   016520
JSR4    016612
JSR4A   016630
JSR4B   016640
JSR5    016716
JSR5A   016742
JSR5B   016752
JSR6    016652
JSR6A   016676
JSR6AD  017022
JSR6B   016706
JSR7    016764
JSR7A   017002
JSR7B   017012
K1      027404
K10     027422
K11     027424
K12     027426
K2      027406
K3      027410
K4      027412
K5      027414
K6      027416
K7      027420
LAST  =%000001
LF    = 000012
LPADR   000172
MBDM2A  012534
MBDM2B  012544
MBDM2C  012562
MBDM2D  012574
MBDM2E  012604
MBDM2F  012622
MBDM4A  013156
MBDM4B  013174
MBDM4C  013206
MBDM4D  013216
MBDM4E  013232
MDM1A   012366
MDM1B   012376
MDM2A   012442
MDM2B   012452
MDM2C   012460
MDM2D   012470
MDM3A   012676
MDM3B   012706
MDM3C   012724
MDM3D   012744
MDM3E   012772

MDM4A   013052
MDM4B   013062
MDM4C   013076
MDM5A   013302
MDM5B   013312
MDM5C   013330
MDM5D   013346
MDM5E   013374
MDM6A   013444
MDM6B   013454
MDM6C   013472
MDM6D   013512
MDM6E   013542
MDM7A   013616
MDM7B   013626
MDM7C   013644
MDM7D   013664
MDM7E   013710
MFPI0   024764
MFPI0A  025012
MFPS1   023524
MFPS2A  023614
MFPS2B  023624
MFPS2C  023644
MFPS3A  023722
MFPS3B  023732
MFPS3C  023752
MFPS4A  024030
MFPS4B  024040
MFPS4C  024060
MFPS5A  024136
MFPS5B  024146
MFPS5C  024166
MFPS6A  024246
MFPS6B  024256
MFPS6C  024276
MFPS7A  024356
MFPS7B  024366
MFPS7C  024406
MFPT  = 000007
MOR0    026062
MOR1    026122
MOR2    026202
MOR3    026274
MOR4    026314
MOR5    026334
MOR6    026424
MOR7    026444
MOR8    026464
MOV1    017160
MOV2    017170
MOV3    017206
MRK1    022564

MRK2    022606
MRK3    022616
MRK4    022640
MRK5    022652
MRK6    022666
MSGERR  060654
MSGPWF  061002
MSG1    060346
MTPI0   025076
MTPS1   022736
MTPS1A  022756
MTPS2   023032
MTPS3   023122
MTPS4   023210
MTPS5   023270
MTPS6   023360
MTPS7   023450
N     = 000307
NBR     025266
NEGAT   043554
NEG00   004312
NEG01   004322
NEG02   004336
NEG03   004352
NEG04   004362
NEG1    020514
NEG10   004426
NEG11   004436
NEG12   004454
NEG13   004470
NEG14   004500
NEG2    020524
NEG20   004546
NEG21   004556
NEG22   004604
NEG3    020546
NEG30   005126
NEG31   005136
NEG32   005152
NEG33   005176
NEG34   005212
NEG4    020556
NEG40   005604
NEG41   005614
NEG42   005630
NEG5    020576
NEG50   005704
NEG51   005714
NEG52   005730
NEG60   006006
NEG61   006016
NEG70   006066
NEG71   006076

NODL    040172
NODL1   040356
NODL2   040440
NODL3   040710
NOP   = 000240
NOR     037406
NOSUB   037524
PASSPT  062304
PCN01   026516
PCN1    041116
PCN2    026552
PCN3    026620
PCN4    026662
PCN5    026722
PFRES   060776
POWER   042232
PROFTE  037656
PS    = 177776
PSWORD  042142
PUSRM = 030000
PWAIT   060754
PWAIT1  060770
PWRDN   060716
PWRUP   060726
RA      033474
RA1     032136
RB      033462
RB1     032124
RC      033456
RC1     032120
REGR1   042550
REGR2   042716
REGR23  045426
REGR3   043064
REGR4   043230
REGR5   043400
REG01   045226
REG1    002032
REG1A   002076
REG1E   002044
REG2    002146
REG2A   002174
REG2B   002222
REG2C   002254
REG3    002302
REG3A   002346
REG3E   002314
REG4    002416
REG4A   002462
REG4E   002430
REG45   045626
REG5    002532
REG5A   002576
```

```
REG5E   002544
REG6    002646
REG6A   002712
REG6E   002660
RESET2  040510
RESET3  040500
REST    024464
RESTRT  001024
RET     042006
RETA    030636
RETAH   030646
RETAT   036536
RETA1   031412
RETA2   032220
RETA3   032752
RETA4   033556
RETA5   034310
RETB    030672
RETBT   036604
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RETB2   032244
RETB3   032776
RETB4   033602
RETB5   034334
RETC    030734
RETCT   036656
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RETC3   033040
RETC4   033644
RETC5   034376
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RETD2   032360
RETD3   033112
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RETD5   034450
RETE    031052
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RETE2   032424
RETE3   033156
RETE4   033762
RETE5   034514
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RETF1   031664
RETF2   032474
RETF3   033226
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RETF5   034564
RETG    031234
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RETG2   032606
RETG3   033340
RETG4   034144
RETG5   034676
RETH5   035024
RETJ    035050
RETK    035112
RETL    035164
RETM    035230
RETN    035300
RETO    035410
RETR1   041132
RETR2   041210
RETR3   041256
RET1    042024
RET2    042044
RET3    042062
RET4    042052
RITSH   046036
ROL1    021400
ROL2    021410
ROL3    021426
ROL4    021436
ROL5    021452
ROL6    021462
ROL7    021504
ROR1    021546
ROR2    021556
ROR3    021574
ROR4    021604
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ROR6    021632
ROR7    021646
ROTX    015164
ROTXAD  015310
ROT0A   014302
ROT0B   014312
ROT0C   014334
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ROT1D   014446
ROT1E   014476
ROT2A   014550
ROT2B   014560
ROT2C   014610
ROT2D   014620
ROT2E   014654
ROT3A   014722
ROT3B   014732
ROT3C   014760
ROT3D   014770
ROT3E   015016
ROT4    015072
ROT5    015154
ROT6    015224
ROT7    015300
RTI1    037106
RTI2    037120
RTRAP = 000010
RTRAP1= 000034
RTRAP2= 000020
RTRAP3= 000030
RTRAP4= 000014
RTRAP5= 000004
RTS1    017114
RTT1    036734
RTT2    036750
RTT3    037012
RTT4    037030
RTT5    036764
RTT6    037050
ROTRAP  037440
R1ERR   002114
R2ERR   002244
R3ERR   002364
R4ERR   002500
R5ERR   002614
R6     =%000006
R6ERR   002730
R7     =%000007
R7TRX   040026
SBC1    021232
SBC2    021242
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SBC4    021270
SBC5    021306
SBC6    021316
SBC7    021336
SB0     015342
SB2     015464
SB4     015610
SB5     015676
SB5A    015670
SB5X    015706
SB5XAD  015710
SB6     015750
SB6X    015760
SB7     016020
SB7X    016030
SB7XAD  016032
SCOPE = 000240
SC3     026000
SC4     026014
SECPRT  027400
SETBR   025146
SETCC   025166
SETCD   025776
SETUP   025130
SET2BR  025236
SHL     001502
SHLE    001516
SHR     001616
SHRE    001632
SKPMSG  060316
SKP104  037672
SKTST2  040526
SNMB0A  006272
SNMB1A  006376
SNMB1B  006406
SNMB1C  006430
SNMB2A  006552
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SNMB2C  006576
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SNMB3A  006770
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SNMB3C  007016
SNMB3D  007026
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SNM1A   006334
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SNM2B   006502
SNM3A   006702
SNM3B   006712
SNM4A   007076
SNM4B   007106
SNM5A   007160
SNM5B   007170
SNM6A   007244
SNM6B   007254
SNM7A   007326
SNM7B   007336
SOB1    022446
SOB2    022454
SOB3    022464
SOB4    022504
SOPA    006150
SOPB    006170
SOPB0A  003560
SOPB0B  003570
SOPB1A  003702
SOPB1B  003720
SOPB1C  003764
SOPB1D  004004
SOPB2A  004140
SOPB2B  004160
SOPB2C  004230
SOPB2D  004254
SOPB3A  004742
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SOPB3C  005034
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SOPX    006134
SOPXAD  006200
SOPZA   004052
SOP0A   003416
SOP0B   003436
SOP0C   003500
SOP0D   003524
SOP1A   003626
SOP1B   003640
SOP2B   004072
SOP3A   004656
SOP3B   004672
SOP4A   005270
SOP4B   005310
SOP5A   005366
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SOP7A   005530
SOP7B   005544
START   001002
STATUS= 177776
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STPP    031322
STPPA   031332
STP3    037314
STP3D   037324
STP4    041064
STP4E   041074
SUB0    007472
SUB0A   007502
SUB1    021060
SUB2    021070
SUB3    021112
SUB4    021122
SUB5    021140
SUB6    021150
SUB7    021170
SWB1    020122
SWB2    020132
SWB3    020150
SWR     042212
SWREG   000176
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SW11  = 004000
SW12  = 010000
SXT0    022244
SXT1    022254
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S11       042210
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S5        042174
S6        042176
S7        042200
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S9        042204
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TDEC2     035562
TDEC3     035630
TDEC4     035676
TDEC6     035712
TDEC7     035722
TDEC77    040010
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TEMP1     042144
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TEMP3     042150
TEMP4     042152
TEMP5     042154
TEMP6     042156
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TEST2     020044
TEST3     020062
THRPRT    042242
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TKS     = 177560
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TO10      027310
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TO14      027320
TO244     027360
TO250     027370
TO30      027330
TO34      027340
TO4       027300
TPB     = 177566
TPS     = 177564
TRACE     037210
TRAPA   = 000077
TRAPB     037620
TRAP10    041672
TRAP24    041662
TRCSR   = 177560
TRC1      037304
TRPADR    037430
TRT     = 000003
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TR2       040160
TR3       040306
TR4       040320
TR5       040310
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TST164    046216
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TST166    046300
TST167    046330
TST170    046366
TST171    046412
TST172    046440
TST173    046462
TST174    046520
TST175    046554
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TST177    046730
TST200    047026
TST201    047130
TST202    047226
TST203    047324
TST204    047426
TST205    047524
TST206    047652
TST207    047756
TST210    050062
TST211    050166
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TST234    052474
TST235    052572
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TS206     017306
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TS77     006344
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TTYOUT   042216
TTY11    040674
TTY3     040614
TTY4     040666
TYPCNT   042160
TYPDS  = 104405
TYPE   = 104401
TYPOC  = 104402
TYPON  = 104404
TYPOS  = 104403
USP1     024510
USP1A    024534
USP2     024610
USP3     024634
USP4     024670
USRM   = 140000
USTBOT   027300
VDEC1    035764
VDEC10   036214
VDEC11   036264
VDEC12   036274
VDEC13   036352
VDEC14   036362
VDEC2    035754
VDEC3    036034
VDEC4    036024
VDEC5    036104
VDEC6    036074
VDEC7    036154
VDEC8    036144
VDEC9    036224
WATE     041036
WATE1    040762
WATE2    040776
WATE3    041024
XOR1     022360
XOR2     022370
XOR3     022416
XXT      041526
YBR      025272
YNTAB    027226
$APTHD   000330
$ATYC    061340
$ATY1    061314
$ATY3    061322
$ATY4    061332
$CHARC   061300
$CPUOP   000326
$CRLF    042224
$DBLK    061776
$DEVCT   000310
$DOAGN   060502
$DTBL    061766
$ENDAD   060472
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$ENDMG   060511
$ENULL   060506
$ENV     000320
$ENVM    000321
$EOP     060414
$EOPCT   060432
$ERN   = 001162
$ERROR=  000302
$ETABL   000320
$ETEND   000330
$FATAL   000302
$FFLG    061560
$FILLC   061306
$FILLS   061305
$GET42   060462
$HIBTS   000330
$HLT     060526
$LF      061311
$LFLG    061557
$MAIL    000300
$MBADR   000332
$MFLG    061556
$MSGAD   000314
$MSGLG   000316
$MSGTY   000300
$NULL    061304
$OCNT    062230
$OMODE   062232
$PASS    000306
$PASTM   000336
$QUES    061310
$RTNAD   060504
$SETUP=  000020
$STUP  = 177777
$SVPC  = 000400
$SWR   = 000000
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$TESTN  000304      $TRAP     062234      $TYPDS   061562     $TYPOS   062006      $XXX   = 000665
$TN   = 000413      $TRAP2    062256      $TYPE    061022     $UNIT    000312      $$GET4= 000000
$TPB    042220      $TRP    = 000006      $TYPEC   061234     $UNITM   000340      $OFILL   062231
$TPCNT  042161      $TRPAD    062270      $TYPEX   061302     $USWR    000324      .      = 062306
$TPFLG  061307      $TSTM     000334      $TYPOC   062032     $X     = 041626      .$X    = 000330

. ABS.  062306    000

 ERRORS DETECTED:  0

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 RUN-TIME: 145 181 4 SECONDS
 RUN-TIME RATIO: 712/331=2.1
 CORE USED:  27K  (53 PAGES)
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