DCF11-AA

DCF11-AA DIAG
CJKDBC0

AH-F140C-MC
FICHE 1 OF 2

MAY 1980

digital

DCF11-AA

DCF11-AA DIAG
CJKDBCO

AH-F140C-MC
FICHE 2 OF 2

MAY 1980

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        000000                  .REPT 0

                                               IDENTIFICATION
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                                PRODUCT CODE:     AC-F141C-MC

                                PRODUCT NAME:     CJKDBC0 DCF11-AA DIAG

                                DATE:             NOV-79

                                MAINTAINER:       DIAGNOSTIC ENGINEERING

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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

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

BIT #	OCTAL VALUE	FUNCTION
15	100000............	HALT ON ERROR
13	020000............	INHIBIT ERROR PRINTOUT
1	000002............	CIS CHIP SET PRESENT
0	000001............	SKIP TRAPS TEST

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

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

8.0 EXECUTION TIMES

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

9.0 ROUTINES ABSTRACT

9.1 HALT ROUTINE (APPLICABLE ONLY TO PART THREE).

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

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


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

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


                              .ENDR
```

```



                            ;PROGRAMMER: KIN C. LEE

                                    .TITLE  CJKDB-C  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  060462              $ENDAD                          ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
                000052              .=52
        000052  000000              .WORD   0                       ;;2)SET LOC.52 TO ZERO
                000400              .=$SVPC                         ;; RESTORE PC
                000300              .=300
                            .SBTTL  APT MAILBOX-ETABLE

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

```
                                        .MEXIT
                                        .SBTTL  APT PARAMETER BLOCK

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

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

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

                                ;*******************************************************************************
                                ;DATA TABLE FOR USE IN ADDRESSING MODE TESTS
                                ;*******************************************************************************
        000370                                  .=370
000370  000000  000000  000000                  0,0,0,0,0,0
```

```
000376  000000  000000  000000
000404  000001  000001  177777          1,1,-1
                                ;*******************************************************************************
                                ;SET UP STARTING ADDRESS
        000302                  $ERROR=$FATAL
        000304                  $TSTNM=$TESTN
        001000                  .=1000
001000  000000                  STBOT:  .WORD 0                                 ;STACK POINTER

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

        001002                  .=1002
                                .SBTTL **STARTING OF CPU TEST **
001002  012737  061002  000024  START:  MOV     #PWRDN,@#24             ;SET UP FOR POWER FAIL
001010  012737  000000  000306          MOV     #0,@#$PASS      ;CLEAR PASS COUNT
001016  012737  000016  062370          MOV     #16,@#PASSPT    ;SET PRINT COUNTER
001024  012706  001000          RESTRT: MOV     #STBOT,R6       ;INITIALIZE STACK POINTER
001030  012702  000304                  MOV     #$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
```

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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
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
```

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002030  000241                   CLC                          ;CLEAR C-BIT
002032  005200           REG1:   INC     R0                   ;INCREMENT BIT COUNTER
002034  001403                   BEQ     REG1E                ;BR TO ERROR HALT IF BIT IS LOST
002036  006101                   ROL     R1                   ;ROTATE 1 POSITION
002040  103374                   BCC     REG1                 ;ALL DONE
002042  001404                   BEQ     TS20

                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                              ;           CONDITIONAL 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   <====
                                                        ;               FOLLOWING W/ 771               <====
002160  012702  000304          MOV     #$TESTN,R2      ;RESTORE POINTER
002164  012742  000025          MOV     #25,-(R2)       ;MOVE TO MAILBOX #  *******  25  *******
002170  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002172  000000                  HALT                    ;FAILURE WITH R2
002174  012702  000304  REG2A:  MOV     #$TESTN,R2              ;RESTORE POINTER

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

                        ;*******************************************************************************
                        ;TEST 23        TEST IF R3 CAN HOLD A ONE IN ALL BITS
                        ;*******************************************************************************
002260  005212          TS23:   INC     (R2)            ;UPDATE TEST NUMBER
002262  022712  000023          CMP     #23,(R2)        ;SEQUENCE ERROR?
002266  001012                  BNE     TS24-10         ;BR TO ERROR HALT ON SEQ ERROR
002270  012703  000001          MOV     #1,R3           ;SET BIT 0
002274  012700  177757          MOV     #-21,R0         ;SET BIT COUNTER
002300  000241                  CLC                     ;CLEAR C-BIT
002302  005200          REG3:   INC     R0              ;INCREMENT BIT COUNTER
002304  001403                  BEQ     REG3E           ;BR TO ERROR HALT IF BIT IS LOST
002306  006103                  ROL     R3              ;ROTATE 1 POSITION
002310  103374                  BCC     REG3            ;ALL DONE
002312  001404                  BEQ     TS24

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 765              <====
002314                  REG3E:
002314  012742  000027          MOV     #27,-(R2)       ;MOVE TO MAILBOX #  *******  27  *******
002320  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002322  000000                  HALT                    ;FAILURE WITH R3
                                                        ;  OR SEQUENCE ERROR

                        ;*******************************************************************************
                        ;TEST 24        TEST IF R3 CAN HOLD A ZERO IN ALL BITS
```

```
                                   ;*******************************************************************************
002324  005212                     TS24:   INC     (R2)            ;UPDATE TEST NUMBER
002326  022712  000024                     CMP     #24,(R2)        ;SEQUENCE ERROR?
002332  001014                             BNE     TS25-10         ;BR TO ERROR HALT ON SEQ ERROR
002334  012703  177776                     MOV     #-2,R3          ;SET ALL ONES IN R3 EXCEPT FOR BIT 0
002340  012700  177757                     MOV     #-21,R0         ;SET BIT COUNTER
002344  000261                             SEC                     ;SET C-BIT
002346  005200                     REG3A:  INC     R0              ;INCREMENT BIT COUNTER
002350  001405                             BEQ     R3ERR           ;BR TO ERROR HALT IF COUNTER=0
002352  006103                             ROL     R3              ;ROTATE 1 POSITION
002354  103774                             BCS     REG3A           ;CONTINUE UNTIL C-BIT IS CLEAR
002356  022703  177777                     CMP     #-1,R3          ;CHECK DATA
002362  001404                             BEQ     TS25
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                   ;           CONDITIONAL BRANCH INST. AND   <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                   ;           WHICH FOLLOWS W/ 763           <====
002364                             R3ERR:
002364  012742  000030                     MOV     #30,-(R2)       ;MOVE TO MAILBOX #  *******  30  *******
002370  005242                             INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002372  000000                             HALT                    ;FAILURE WITH R3
                                                                   ;  OR SEQUENCE ERROR

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

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

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

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

```
002742  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
002744  000000                          HALT                    ;FAILURE WITH R6
                                                                ;  OR SEQUENCE ERROR

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

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

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

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

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

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

```
003150  000257                  CCC                     ;CC=0100: JUST Z-BIT
003152  000264                  SEZ
003154  001001                  BNE     BRZ1            ;CHECK OPPOSITE CONDITION
003156  001404                  BEQ     BRZ2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 773            <====
003160                          BRZ1:
003160  012742  000043          MOV     #43,-(R2)       ;MOVE TO MAILBOX #  *******  43  *******
003164  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003166  000000                  HALT                    ;IMPROPER BR W/ Z=1
                                ;CHECK WITH Z-BIT OFF
003170  000277          BRZ2:   SCC                     ;CC=1011: ALL BUT Z-BIT
003172  000244                  CLZ
003174  001401                  BEQ     BRZ3
003176  001004                  BNE     TS40
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 763            <====
003200                          BRZ3:
003200  012742  000044          MOV     #44,-(R2)       ;MOVE TO MAILBOX #  *******  44  *******
003204  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003206  000000                  HALT                    ;IMPROPER BR W/ Z=0
                                                        ;  OR SEQUENCE ERROR

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

```
003230  012742  000045          MOV     #45,-(R2)       ;MOVE TO MAILBOX #  *******  45  *******
003234  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003236  000000                  HALT                    ;IMPROPER BR W/ N=1
                                ;CHECK WITH N-BIT OFF
003240  000277          BRN2:   SCC                     ;CC=0111
003242  000250                  CLN
003244  100401                  BMI     BRN3            ;CHECK OPPOSITE CONDITION
003246  100004                  BPL     TS41
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 763             <====
003250                  BRN3:
003250  012742  000046          MOV     #46,-(R2)       ;MOVE TO MAILBOX #  *******  46  *******
003254  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003256  000000                  HALT                    ;IMPROPER BR W/ N=0
                                                        ;  OR SEQUENCE ERROR

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

```
003324  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003326  000000                  HALT                    ;IMPROPER BR W/ V=0
                                                        ;  OR SEQUENCE ERROR

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

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

```
                                ;ONLY INSTRUCTIONS AND ADDRESSING MODES WHICH HAVE BEEN PREVIOUSLY
                                ;VERIFIED.
                                ;       IF THESE TESTS FAIL, CHECK THE RESULTS FOR A CLUE TO THE
                                ;FAULT.
                                ;
                                ;*******************************************************************************



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

```
                                                          ; OR SEQUENCE ERROR


                                  ;**************************************************************************
                                  ;
                                  ;        THIS TEST INTRODUCES 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
                                  ;**************************************************************************
 003460  005212                   TS44:   INC     (R2)            ;UPDATE TEST NUMBER
 003462  022712  000044                   CMP     #44,(R2)        ;SEQUENCE ERROR?
 003466  001021                           BNE     TS45-10         ;BR TO ERROR HALT ON SEQ ERROR
 003470  005000                           CLR     R0              ;INITIALIZE
 003472  005300                           DEC     R0              ;TRY DECREMENT INST.
 003474  100404                           BMI     SOPOC
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                          ;           WHICH FOLLOWS W/ 774            <====
 003476  012742  000056                   MOV     #56,-(R2)       ;MOVE TO MAILBOX #  *******  56  *******
 003502  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 003504  000000                           HALT                    ;N-BIT NOT SET ON DEC
 003506  000261                   SOPOC:  SEC                     ;INITIALIZE CARRY
 003510  005500                           ADC     R0              ;TRY ADD CARRY INST
 003512  001007                           BNE     SOPOD
 003514  000261                           SEC                     ;INITIALIZE CARRY
 003516  005600                           SBC     R0              ;TRY SUBTRACT-CARRY INST
 003520  100004                           BPL     SOPOD
 003522  005100                           COM     R0
 003524  005200                           INC     R0
 003526  005300                           DEC     R0
 003530  001404                           BEQ     TS45
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                          ;           WHICH FOLLOWS W/ 756            <====
 003532                           SOPOD:
 003532  012742  000057                   MOV     #57,-(R2)       ;MOVE TO MAILBOX #  *******  57  *******
 003536  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 003540  000000                           HALT                    ; CUMMULATIVE RESULT OF ADC,SBC,COM,INC AND DEC INSTS. F
                                                          ;  OR SEQUENCE ERROR

                                  ;**************************************************************************
                                  ;
                                  ;        THIS TEST INTRODUCES THE BYTE CONTROL LOGIC OF THE PROCESSOR.
                                  ;THE MODE 0 BYTE MICROCODE IS TESTED.  THE METHOD AND SEQUENCE
                                  ;OF TESTING IS THE SAME AS THAT USED IN THE SOP MODE 0 TESTS.
                                  ;
                                  ;**************************************************************************
                                  ;TEST 45        TEST MODE 0 EVEN BYTE USING SOP INST
```

```
                                ;*************************************************************************************
003542  005212          TS45:   INC     (R2)            ;UPDATE TEST NUMBER
003544  022712  000045          CMP     #45,(R2)        ;SEQUENCE ERROR?
003550  001012                  BNE     TS46-10         ;BR TO ERROR HALT ON SEQ ERROR
003552  105000                  CLRB    R0              ;TRY CLEARING EVEN BYTE OF REGISTER
003554  001404                  BEQ     SOPB0A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 775            <====
003556  012742  000060          MOV     #60,-(R2)       ;MOVE TO MAILBOX #  *******  60  *******
003562  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003564  000000                  HALT                    ;CLRB DID NOT SET Z-BIT
003566  105100          SOPB0A: COMB    R0              ;TRY SETTING EVEN BYTE OF REGISTER
003570  100002                  BPL     SOPB0B
003572  105200                  INCB    R0              ;TRY INCREMENTING EVEN BYTE OF REGISTER>>
003574  001404                  BEQ     TS46
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 765            <====
003576                  SOPB0B:
003576  012742  000061          MOV     #61,-(R2)       ;MOVE TO MAILBOX #  *******  61  *******
003602  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003604  000000                  HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE BYTE INST.
                                                        ;  OR SEQUENCE ERROR

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

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003640  000261                          SEC                     ;INITIALIZE CARRY
003642  005510                          ADC     (R0)            ;TRY ADD-CARRY W/MODE 1
003644  001404                          BEQ     TS47
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 763             <====
003646                          SOP1B:
003646  012742  000063                  MOV     #63,-(R2)       ;MOVE TO MAILBOX #  *******  63  *******
003652  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003654  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST
                                                                ;  OR SEQUENCE ERROR

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

```
                                ;*************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THAT SINGLE OPERAND BYTE INSTRUCTIONS WILL
                                ;FUNCTION CORRECTLY FOR ODD BYTES.
                                ;       THIS IS THE FIRST TIME THAT ADDRESS LINE 0 HAS BEEN
                                ;EXERCISED.  CHECKS ARE MADE THAT THE PROPER BYTE IS MODIFIED AND
                                ;THE CONDITION CODES ARE CHECKED.  IT IS ALSO VERIFIED THAT THE UNADDRESSED
                                ;BYTE IS NOT ALTERED BY THE INSTRUCTION.
                                ;
                                ;*************************************************************************
                                ;TEST 50        TEST MODE 1 ODD BYTE USING SOP INST
                                ;*************************************************************************
003736  005212                  TS50:   INC     (R2)            ;UPDATE TEST NUMBER
003740  022712  000050                  CMP     #50,(R2)        ;SEQUENCE ERROR?
003744  001022                          BNE     TS51-10         ;BR TO ERROR HALT ON SEQ ERROR
003746  005000                          CLR     R0              ;INITIALIZE R0
003750  005010                          CLR     (R0)            ;INITIALIZE LOC. 0
003752  005110                          COM     (R0)
003754  005200                          INC     R0              ;R0=ODD BYTE
003756  105010                          CLRB    (R0)            ;TRY TO CLEAR BYTE 1
003760  001404                          BEQ     SOPB1C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND  <====
                                                                ;           REPLACE THE MOVE INSTRUCTION  <====
                                                                ;           WHICH FOLLOWS W/ 771          <====
003762  012742  000066                  MOV     #66,-(R2)       ;MOVE TO MAILBOX #  *******  66  *******
003766  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
003770  000000                          HALT                    ;CLRB DID NOT SET Z-BIT
003772  005300                  SOPB1C: DEC     R0              ;R0=WORD ADDR.
003774  005210                          INC     (R0)            ;INCREMENT TO TEST WORD
003776  005200                          INC     R0              ;R0=ODD BYTE
004000  105110                          COMB    (R0)            ;TRY TO COMPLEMENT BYTE 1
004002  105210                          INCB    (R0)
004004  100002                          BPL     SOPB1D
004006  105210                          INCB    (R0)            ;TRY TO INCREMENT BYTE 1
004010  001404                          BEQ     TS51
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND  <====
                                                                ;           REPLACE THE MOVE INSTRUCTION  <====
                                                                ;           WHICH FOLLOWS W/ 755          <====
004012                          SOPB1D:
004012  012742  000067                  MOV     #67,-(R2)       ;MOVE TO MAILBOX #  *******  67  *******
004016  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004020  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST.
                                                                ;  OR SEQUENCE ERROR

                                ;*************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 2 SINGLE-OPERAND INSTRUCTIONS.  PREVIOUSLY
                                ;TESTED INSTRUCTIONS ARE USED TO SET A POINTER IN R0 TO LOC. 400.
                                ;LOC. 400 IS INITIALIZED TO -1 BEFORE A CLR MODE 2 IS EXECUTED.
                                ;       THEN R0 IS DECREMENTED BY TWO TO AGAIN POINT TO 400 BEFORE EACH
                                ;OF SEVERAL MODE 2 INSTRUCTIONS ARE USED TO VERIFY THE DATA RESULTS OF
                                ;THE TEST.  THIS PROCEDURE ALSO VERIFIES THE PROPER INCREMENTING OF THE
                                ;REGISTER.
                                ;
```

```
                                  ;*******************************************************************************
                                  ;TEST 51        TEST MODE 2 USING SOP INST.
                                  ;*******************************************************************************
004022  005212                    TS51:   INC     (R2)            ;UPDATE TEST NUMBER
004024  022712  000051                    CMP     #51,(R2)        ;SEQUENCE ERROR?
004030  001023                            BNE     TS52-10         ;BR TO ERROR HALT ON SEQ ERROR
004032  005000                            CLR     R0              ;SET R0=400
004034  105100                            COMB    R0
004036  005200                            INC     R0
004040  005010                            CLR     (R0)            ;CLEAR 400
004042  005110                            COM     (R0)            ;INITIALIZE: 400=-1
004044  005020                            CLR     (R0)+           ;TRY CLEARING WITH MODE 2
004046  001404                            BEQ     SOPZA
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND       <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION       <====
                                                                  ;           WHICH FOLLOWS W/ 770               <====
004050  012742  000070                    MOV     #70,-(R2)       ;MOVE TO MAILBOX #  *******  70  *******
004054  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004056  000000                            HALT                    ;CLR INST DID NOT SET Z-BIT
004060  005300                    SOPZA:  DEC     R0              ;RESET R0
004062  005300                            DEC     R0
004064  005120                            COM     (R0)+           ;TRY COMPLEMENTING WITH MODE 2
004066  100004                            BPL     SOP2B
004070  005300                            DEC     R0              ;RESET R0
004072  005300                            DEC     R0
004074  005220                            INC     (R0)+           ;TRY INCREMENTING WITH MODE 2
004076  001404                            BEQ     TS52
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND       <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION       <====
                                                                  ;           WHICH FOLLOWS W/ 754               <====
004100                            SOP2B:
004100  012742  000071                    MOV     #71,-(R2)       ;MOVE TO MAILBOX #  *******  71  *******
004104  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004106  000000                            HALT                    ;CHECK CUMMULATIVE RESULT OF ABOVE INST
                                                                  ;  OR SEQUENCE ERROR

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

```
004124  005200                    INC     R0
004126  005010                    CLR     (R0)            ;CLEAR 400
004130  005110                    COM     (R0)            ;INITIALIZE: 400=-1
004132  105020                    CLRB    (R0)+           ;TRY TO CLEAT 400 W/MODE 2
004134  001404                    BEQ     SOPB2A
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                          ;           CONDITIONAL BRANCH INST. AND       <====
                                                          ;           REPLACE THE MOVE INSTRUCTION       <====
                                                          ;           WHICH FOLLOWS W/ 770               <====
004136  012742  000072            MOV     #72,-(R2)       ;MOVE TO MAILBOX #  *******  72  *******
004142  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004144  000000                    HALT                    ;CLR DID NOT SET Z-BIT
004146  005300            SOPB2A: DEC     R0              ;RESULT R0=400
004150  005210                    INC     (R0)            ;INC 400 TO TEST WORD
004152  105110                    COMB    (R0)
004154  105220                    INCB    (R0)+           ;TRY TO INC EVEN BYTE
004156  100003                    BPL     SOPB2B
004160  005300                    DEC     R0              ;RESET R0=400
004162  105220                    INCB    (R0)+           ;TRY INCREMENT OF EVEN BYTE
004164  001404                    BEQ     TS53
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                          ;           CONDITIONAL BRANCH INST. AND       <====
                                                          ;           REPLACE THE MOVE INSTRUCTION       <====
                                                          ;           WHICH FOLLOWS W/ 754               <====
004166                    SOPB2B:
004166  012742  000073            MOV     #73,-(R2)       ;MOVE TO MAILBOX #  *******  73  *******
004172  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004174  000000                    HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INST.
                                                          ;  OR SEQUENCE ERROR

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

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004236 005300          SOPB2C: DEC    R0              ;R0=WORD ADDR.
004240 005300                  DEC    R0
004242 005220                  INC    (R0)+           ;INCREMENT WORD
004244 005300                  DEC    R0              ;POINT TO ODD BYTE
004246 105110                  COMB   (R0)            ;COMPLEMENT ODD BYTE
004250 105220                  INCB   (R0)+           ;TRY TO INCREMENT ODD BYTE
004252 100003                  BPL    SOPB2D
004254 005300                  DEC    R0              ;RESET R0 TO ODD BYTE
004256 105220                  INCB   (R0)+           ;TRY TO INCREMENT ODD BYTE
004260 001404                  BEQ    TS54
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
                                                      ;           WHICH FOLLOWS W/ 751             <====
004262                 SOPB2D:
004262 012742 000075           MOV    #75,-(R2)       ;MOVE TO MAILBOX #  *******  75  *******
004266 005242                  INC    -(R2)           ;SET MSGTYP TO FATAL ERROR
004270 000000                  HALT                   ;TEST CUMMULATIVE RESULT OF ABOVE INST.
                                                      ;  OR SEQUENCE ERROR

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

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

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

004444 005237 000000    NEG11:  INC     @#0             ;TEST DATA RESULT
004450 001404                   BEQ     NEG12
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 760             <====
004452 012742 000103            MOV     #103,-(R2)      ;MOVE TO MAILBOX #  *******  103  *******
004456 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
004460  000000                     HALT                    ;DATA RESULT OF NEGATE INCORRECT
004462  105110             NEG12:  COMB    (R0)            ;LOC. 0=377
004464  105410                     NEGB    (R0)            ;TRY NEGB LOC. 0=1
004466  100403                     BMI     NEG13           ;CC=0001?
004470  001402                     BEQ     NEG13
004472  102401                     BVS     NEG13
004474  103404                     BCS     NEG14

                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 746            <====
004476                     NEG13:
004476  012742  000104             MOV     #104,-(R2)      ;MOVE TO MAILBOX #  *******  104  *******
004502  005242                     INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004504  000000                     HALT                    ;NEGB DID NOT SET CC'S CORRECTLY
004506  005337  000000     NEG14:  DEC     @#0             ;TEST DATA RESULT
004512  001404                     BEQ     TS56

                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 737            <====
004514  012742  000105             MOV     #105,-(R2)      ;MOVE TO MAILBOX #  *******  105  *******
004520  005242                     INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004522  000000                     HALT                    ;DATA RESULT OF NEGB INCORRECT
                                                           ;  OR SEQUENCE ERROR

                           ;*******************************************************************************
                           ;TEST 56          TEST MODE 2 USING NEGATE INSTRUCTION
                           ;*******************************************************************************
004524  005212             TS56:   INC     (R2)            ;UPDATE TEST NUMBER
004526  022712  000056             CMP     #56,(R2)        ;SEQUENCE ERROR?
004532  001032                     BNE     TS57-10         ;BR TO ERROR HALT ON SEQ ERROR
004534  005000                     CLR     R0              ;POINT TO LOC. 0
004536  005010                     CLR     (R0)            ;CLEAR LOC. 0
004540  005210                     INC     (R0)            ;LOC. 0=1
004542  005420                     NEG     (R0)+           ;TRY NEG.: LOC. 0=-1
004544  100003                     BPL     NEG20           ;CC=1001?
004546  001402                     BEQ     NEG20
004550  102401                     BVS     NEG20
004552  103404                     BCS     NEG21

                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 767            <====
004554                     NEG20:
004554  012742  000106             MOV     #106,-(R2)      ;MOVE TO MAILBOX #  *******  106  *******
004560  005242                     INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004562  000000                     HALT                    ;NEGATE DID NOT SET CC'S CORRECTLY
004564  105300             NEG21:  DECB    R0              ;R0=LOC. 0
004566  105300                     DECB    R0
004570  105420                     NEGB    (R0)+           ;BYTE 0=1    R0=1
004572  105420                     NEGB    (R0)+           ;BYTE 1=1    R0=2
004574  105340                     DECB    -(R0)           ;R0=1  LOC. 0=01
004576  005300                     DEC     R0              ;R0=0
004600  001404                     BEQ     NEG22

                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
```

```
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 754            <====
004602  012742  000107                  MOV     #107,-(R2)      ;MOVE TO MAILBOX #  *******  107  *******
004606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004610  000000                          HALT                    ;REGISTER NOT INCREMENTED CORRECTLY
004612  005337  000000          NEG22:  DEC     @#0             ;LOC. 0=0
004616  001404                          BEQ     TS57
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                ;               CONDITIONAL BRANCH INST. AND    <====
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 745            <====
004620  012742  000110                  MOV     #110,-(R2)      ;MOVE TO MAILBOX #  *******  110  *******
004624  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004626  000000                          HALT                    ;NEG BYTE INSTRUCTIONS FAILED
                                                                ;  OR SEQUENCE ERROR

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

```
                                                      ;                 CONDITIONAL BRANCH INST. AND    <====
                                                      ;                 REPLACE THE MOVE INSTRUCTION    <====
                                                      ;                 WHICH FOLLOWS W/ 757            <====
004700                          SOP3B:
004700  012742  000112                  MOV     #112,-(R2)      ;MOVE TO MAILBOX #  *******  112  *******
004704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
004706  000000                          HALT                    ;CUMMULATIVE RESULT OF ABOVE INST FAILED
                                                                ;  OR SEQUENCE ERROR

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

```
004774                          SOPB3B:
004774  012742  000114                  MOV     #114,-(R2)      ;MOVE TO MAILBOX #  *******  114  *******
005000  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005002  000000                          HALT                    ;CUMMULATIVE RESULT OF ABOVE INST FAILED
                                                                ;  OR SEQUENCE ERROR


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

```
                                                        ;       OR SEQUENCE ERROR
                              ;*******************************************************************************
                              ;TEST 62          TEST MODE 3 USING NEGATE INSTRUCTION
                              ;*******************************************************************************
005074  005212                TS62:   INC     (R2)              ;UPDATE TEST NUMBER
005076  022712  000062                CMP     #62,(R2)          ;SEQUENCE ERROR?
005102  001054                        BNE     TS63-10           ;BR TO ERROR HALT ON SEQ ERROR
005104  005000                        CLR     R0                ;R0=400
005106  105100                        COMB    R0
005110  005200                        INC     R0
005112  005010                        CLR     (R0)              ;LOC. 400=0
005114  005004                        CLR     R4                ;R4=0
005116  005014                        CLR     (R4)              ;LOC. 0=0
005120  005214                        INC     (R4)              ;LOC. 0=1
005122  005430                        NEG     @(R0)+            ;TRY NEGATE   LOC. 0=-1  R0=402
005124  100003                        BPL     NEG30             ;CC=1001?
005126  001402                        BEQ     NEG30
005130  102401                        BVS     NEG30
005132  103404                        BCS     NEG31
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 763             <====
005134                        NEG30:
005134  012742  000117                MOV     #117,-(R2)        ;MOVE TO MAILBOX #  *******  117  *******
005140  005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
005142  000000                        HALT                      ;NEG DID NOT SET CC'S CORRECTLY
005144  005214                NEG31:  INC     (R4)              ;LOC. 0=0
005146  001404                        BEQ     NEG32
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 755             <====
005150  012742  000120                MOV     #120,-(R2)        ;MOVE TO MAILBOX #  *******  120  *******
005154  005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
005156  000000                        HALT                      ;DATA RESULT OF NEG INCORRECT
005160  105137  000001        NEG32:  COMB    @#1               ;LOC 0=177400
005164  005237  000000                INC     @#0               ;LOC. 0=177401
005170  105430                        NEGB    @(R0)+            ;TRY NEGB LOC. 0=177777  R0=404
005172  100404                        BMI     NEG33
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 743             <====
005174  012742  000121                MOV     #121,-(R2)        ;MOVE TO MAILBOX #  *******  121  *******
005200  005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
005202  000000                        HALT                      ;NEGB FAILED WITH EVEN BYTE
005204  105430                NEG33:  NEGB    @(R0)+            ;TRY NEGB  LOC.0=777  R0=406
005206  100004                        BPL     NEG34
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 735             <====
005210  012742  000122                MOV     #122,-(R2)        ;MOVE TO MAILBOX #  *******  122  *******
005214  005242                        INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
005216  000000                        HALT                      ;NEGB FAILED WITH ODD BYTE
```

```
005220  105137  000001          NEG34:  COMB    @#1             ;LOC. 0=177377
005224  105237  000001                  INCB    @#1             ;LOC. 0=177777
005230  005214                          INC     (R4)            ;LOC. 0=0
005232  001404                          BEQ     TS63
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 723             <====
005234  012742  000123                  MOV     #123,-(R2)      ;MOVE TO MAILBOX #  *******  123  *******
005240  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005242  000000                          HALT                    ;DATA RESULT OF NEGB'S INCORRECT
                                                                ;  OR SEQUENCE ERROR

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

```
                                                         ;  OR SEQUENCE ERROR

                              ;*******************************************************************************
                              ;
                              ;        THIS TEST VERIFIES MODE 5 SINGLE OPERAND INSTRUCTIONS.  IT
                              ;USES LOCATION 0 AS ITS TARGET DATA.  A TABLE LOCATED AT LOC. 372
                              ;THRU 374 IS USED TO SUPPLY THE ADDRESS OF LOCATION 0 TO THE
                              ;INSTRUCTIONS UNDER TEST.
                              ;        R0 IS SET TO 376, (THE START OF THE ADDRESS TABLE) +2,
                              ;AND A CLR INSTRUCTION IS EXECUTED WITH MODE 3 TO CLEAR
                              ;LOC. 0.  THEN R0 IS INCREMENTED BY TWO AND TWO OTHER MODE 3
                              ;INSTRUCTIONS OPERATE ON LOC. 0 TO VERIFY THE DATA RESULTS OF
                              ;THE TEST.  THE PROPER DECREMENTING OF THE REGISTER IS ALSO
                              ;VERIFIED IN THIS MANNER.
                              ;        IF A FAILURE IS DETECTED BE SURE TO VERIFY THAT THE TABLE
                              ;(LOC. 372 THRU 374) HAS THE PROPER VALUES (0).
                              ;
                              ;*******************************************************************************
                              ;TEST 64          TEST MODE 5 USING SOP INSTS
                              ;*******************************************************************************
005326  005212                TS64:   INC     (R2)            ;UPDATE TEST NUMBER
005330  022712  000064                CMP     #64,(R2)        ;SEQUENCE ERROR?
005334  001025                        BNE     TS65-10         ;BR TO ERROR HALT ON SEQ ERROR
005336  012700  000370                MOV     #370,R0         ;CLEAR LOCATION 370-376
005342  005020                        CLR     (R0)+           ;370
005344  005020                        CLR     (R0)+           ;372
005346  005020                        CLR     (R0)+           ;374
005350  005010                        CLR     (R0)            ;376
005352  005000                        CLR     R0              ;SET R0=376 (LOW BYTE)
005354  005020                        CLR     (R0)+
005356  105400                        NEGB    R0
005360  005050                        CLR     @-(R0)          ;TRY TO CLEAR LOC 0 W/MODE 5
005362  001404                        BEQ     SOP5A
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                              ;           WHICH FOLLOWS W/ 764            <====
005364  012742  000126                MOV     #126,-(R2)      ;MOVE TO MAILBOX #  *******  126  *******
005370  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005372  000000                        HALT                    ;CLR DID NOT SET Z-BIT
005374  005200                SOP5A:  INC     R0              ;RESET R0
005376  005200                        INC     R0
005400  005150                        COM     @-(R0)          ;TRY TO COMPLEMENT LOC. 0 W/MODE 5
005402  100002                        BPL     SOP5B
005404  005250                        INC     @-(R0)          ;TRY TO INCREMENT LOC. 0 W/MODE 5
005406  001404                        BEQ     TS65
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                              ;           WHICH FOLLOWS W/ 752            <====
005410                        SOP5B:
005410  012742  000127                MOV     #127,-(R2)      ;MOVE TO MAILBOX #  *******  127  *******
005414  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005416  000000                        HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INSTS
                                                              ;  OR SEQUENCE ERROR
```

```
                                ;*****************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 6 SINGLE OPERAND INSTRUCTIONS.  IT
                                ;USES LOCATION 0 AS ITS TARGET DATA.  R0 IS SET TO 400 USING
                                ;PREVIOUSLY TESTED INSTRUCTIONS AND A MODE 6 CLR INSTRUCTION IS
                                ;EXECUTED ON LOC. 0 USING R0 AND A -400 OFFSET.  COM AND INC
                                ;INSTRUCTIONS ARE THEN USED TO VERIFY THE DATA.
                                ;
                                ;*****************************************************************************
                                ;TEST 65        TEST MODE 6 USING SOP INSTS
                                ;*****************************************************************************
005420  005212                  TS65:   INC     (R2)            ;UPDATE TEST NUMBER
005422  022712  000065                  CMP     #65,(R2)        ;SEQUENCE ERROR?
005426  001020                          BNE     TS66-10         ;BR TO ERROR HALT ON SEQ ERROR
005430  005000                          CLR     R0              ;SET R0=400
005432  105100                          COMB    R0
005434  005200                          INC     R0
005436  005060  177400                  CLR     -400(R0)        ;TRY TO CLEAR LOCATION 0 W/MODE 6
005442  001404                          BEQ     SOP6A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 771            <====
005444  012742  000130                  MOV     #130,-(R2)      ;MOVE TO MAILBOX #  *******  130  *******
005450  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005452  000000                          HALT                    ;CLR DID NOT SET Z-BIT
005454  005160  177400          SOP6A:  COM     -400(R0)        ;TRY TO COMPLEMENT LOCATION 0 W/MODE 6
005460  100003                          BPL     SOP6B
005462  005260  177400                  INC     -400(R0)        ;TRY TO INCREMENT LOCATION 0 W/MODE 6
005466  001404                          BEQ     TS66
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 757            <====
005470                          SOP6B:
005470  012742  000131                  MOV     #131,-(R2)      ;MOVE TO MAILBOX #  *******  131  *******
005474  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005476  000000                          HALT                    ;TEST CUMMULATIVE RESULT OF ABOVE INSTS
                                                                ;  OR SEQUENCE ERROR

                                ;*****************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 7 SINGLE OPERAND INSTRUCTIONS.  IT USES
                                ;THE POINTER TO LOC. 0 WHICH IS STORED AT LOC. 402.
                                ;       R0 IS SET TO 400 AND A MODE 7 CLR INSTRUCTION IS
                                ;EXECUTED WITH A +2 OFFSET TO CLEAR LOC. 0.
                                ;       SEVERAL OTHER MODE 7 INSTRUCTIONS ARE THEN USED ON THE COMMON
                                ;LOCATION TO VERIFY THE DATA RESULTS.
                                ;
                                ;*****************************************************************************
                                ;TEST 66        TEST MODE 7 USING SOP INST.
                                ;*****************************************************************************
005500  005212                  TS66:   INC     (R2)            ;UPDATE TEST NUMBER
005502  022712  000066                  CMP     #66,(R2)        ;SEQUENCE ERROR?
005506  001021                          BNE     TS67-10         ;BR TO ERROR HALT ON SEQ ERROR
005510  005000                          CLR     R0              ;SET R0=400
```

```
005512  105100                  COMB    R0
005514  005200                  INC     R0
005516  005210                  INC     (R0)                    ;R0=1
005520  005070  000002          CLR     @2(R0)                  ;TRY TO CLEAR LOC. 0 W/MODE 7
005524  001404                  BEQ     SOP7A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND     <====
                                                                ;          REPLACE THE MOVE INSTRUCTION     <====
                                                                ;          WHICH FOLLOWS W/ 770             <====
005526  012742  000132          MOV     #132,-(R2)              ;MOVE TO MAILBOX #  *******  132  *******
005532  005242                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
005534  000000                  HALT                            ;CLR DID NOT SET Z-BIT
005536  005170  000002  SOP7A:  COM     @2(R0)                  ;TRY TO COMPLEMENT LOC. 0 W/MODE 7
005542  100003                  BPL     SOP7B
005544  005270  000002          INC     @2(R0)                  ;TRY TO INCREMENT LOC. 0 W/MODE 7
005550  001404                  BEQ     TS67
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND     <====
                                                                ;          REPLACE THE MOVE INSTRUCTION     <====
                                                                ;          WHICH FOLLOWS W/ 756             <====
005552                          SOP7B:
005552  012742  000133          MOV     #133,-(R2)              ;MOVE TO MAILBOX #  *******  133  *******
005556  005242                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
005560  000000                  HALT                            ;TEST CUMMULATIVE RESULT OF ABOVE INSTS.
                                                                ;  OR SEQUENCE ERROR

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

```
005634  000000                      HALT                    ;R0 NOT DECREMENTED PROPERLY
005636  005310             NEG42:   DEC     (R0)            ;TEST DTA RESULT OF NEG
005640  001404                      BEQ     TS70
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 753              <====
005642  012742  000136              MOV     #136,-(R2)      ;MOVE TO MAILBOX #  *******  136  *******
005646  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005650  000000                      HALT                    ;DATA RESULT OF NEG INCORRECT
                                                            ;  OR SEQUENCE ERROR
                           ;*****************************************************************************
                           ;TEST 70         TEST MODE 5 WITH NEGATE INSTRUCTION
                           ;*****************************************************************************
005652  005212             TS70:    INC     (R2)            ;UPDATE TEST NUMBER
005654  022712  000070              CMP     #70,(R2)        ;SEQUENCE ERROR?
005660  001031                      BNE     TS71-10         ;BR TO ERROR HALT ON SEQ ERROR
005662  005000                      CLR     R0              ;R0=0
005664  005010                      CLR     (R0)            ;LOC. 0=0
005666  105100                      COMB    R0              ;R0=377
005670  005200                      INC     R0              ;R0=400
005672  005010                      CLR     (R0)            ;SET 400 = 0
005674  005004                      CLR     R4              ;R4=0
005676  005314                      DEC     (R4)            ;LOC. 0=177777
005700  005450                      NEG     @-(R0)          ;TRY NEGATE:  LOC. 0=1
005702  100403                      BMI     NEG50           ;CC=0001?
005704  001402                      BEQ     NEG50
005706  102401                      BVS     NEG50
005710  103404                      BCS     NEG51
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 763              <====
005712                     NEG50:
005712  012742  000137              MOV     #137,-(R2)      ;MOVE TO MAILBOX #  *******  137  *******
005716  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005720  000000                      HALT                    ;NEG DID NOT SET CC'S CORRECTLY
005722  005314             NEG51:   DEC     (R4)
005724  001404                      BEQ     NEG52
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 755              <====
005726  012742  000140              MOV     #140,-(R2)      ;MOVE TO MAILBOX #  *******  140  *******
005732  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005734  000000                      HALT                    ;DATA RESULT OF NEG INCORRECT
005736  105100             NEG52:   COMB    R0
005740  005300                      DEC     R0
005742  001404                      BEQ     TS71
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                            ;           CONDITIONAL BRANCH INST. AND      <====
                                                            ;           REPLACE THE MOVE INSTRUCTION      <====
                                                            ;           WHICH FOLLOWS W/ 746              <====
005744  012742  000141              MOV     #141,-(R2)      ;MOVE TO MAILBOX #  *******  141  *******
005750  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
005752  000000                      HALT                    ;REGISTER NOT DECREMENTED PROPERLY
```

```
                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 71        TEST MODE 6 WITH NEGATE
                                ;*******************************************************************************
005754  005212                  TS71:   INC     (R2)            ;UPDATE TEST NUMBER
005756  022712  000071                  CMP     #71,(R2)        ;SEQUENCE ERROR?
005762  001022                          BNE     TS72-10         ;BR TO ERROR HALT ON SEQ ERROR
005764  005000                          CLR     R0              ;R0=0
005766  005004                          CLR     R4              ;R4=0
005770  105100                          COMB    R0              ;R0=377
005772  005014                          CLR     (R4)            ;LOC. 0=0
005774  105024                          CLRB    (R4)+           ;LOC. 0=177777,  R4=1
005776  105114                          COMB    (R4)            ;LOC. 0=177400
006000  005460  177401                  NEG     -377(R0)        ;LOC. 0=400
006004  100403                          BMI     NEG60           ;CC=0001
006006  001402                          BEQ     NEG60
006010  102401                          BVS     NEG60
006012  103404                          BCS     NEG61

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

                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                ;           WHICH FOLLOWS W/ 765             <====
006074                          NEG70:
```

```
006074  012742  000144          MOV     #144,-(R2)      ;MOVE TO MAILBOX #  *******  144  *******
006100  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006102  000000                  HALT                    ;NEG DID NOT SET CC'S CORRECTLY
006104  105100          NEG71:  COMB    R0              ;R0=0
006106  105120                  COMB    (R0)+           ;LOC. 0=400,  R0=1
006110  105310                  DECB    (R0)            ;LOC. 0=0
006112  005467  171662          NEG     0               ;USE NEG MODE 67 TO TST FOR ZERO
006116  001404                  BEQ     TS73

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 753              <====
006120  012742  000145          MOV     #145,-(R2)      ;MOVE TO MAILBOX #  *******  145  *******
006124  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006126  000000                  HALT                    ;DATA RESULT OF NEG WAS INCORRECT
                                                        ;  OR SEQUENCE ERROR

                        ;*******************************************************************************
                        ;
                        ;       THIS TEST VERIFIES PROGRAM COUNTER ADDRESSING WITH SOP
                        ;INSTRUCTIONS.  CLR MODE 77 IS USED TO CLEAR THE LOCATION FOLLOWING THE
                        ;INSTRUCTION (SOPX).  THEN SINGLE OPERAND INSTRUCTIONS WITH MODES 37, 67, AND
                        ;77, USING INDIRECT POINTER SOPXAD ARE USED TO VERIFY THE DATA RESULTS
                        ;OF THESE INSTRUCTIONS.
                        ;
                        ;*******************************************************************************
                        ;TEST 73        TEST SOP INSTRUCTIONS MODES 2,3,6,7 WITH REGISTER 7
                        ;*******************************************************************************
006130  005212          TS73:   INC     (R2)            ;UPDATE TEST NUMBER
006132  022712  000073          CMP     #73,(R2)        ;SEQUENCE ERROR?
006136  001017                  BNE     SOPB            ;BR TO ERROR HALT ON SEQ ERROR
006140  005027                  CLR     (R7)+           ;CLEAR NEXT LOCATION: (SOPX)
006142  177777          SOPX:   -1                      ;USE MODE 27
006144  001404                  BEQ     SOPA

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 774              <====
006146  012742  000146          MOV     #146,-(R2)      ;MOVE TO MAILBOX #  *******  146  *******
006152  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006154  000000                  HALT                    ;CLR DID NOT SET Z-BIT
006156  005237  006142  SOPA:   INC     @#SOPX          ;INC SOPX W/MODE 37
006162  005467  177754          NEG     SOPX            ;NEGATE SOPX W/MODE 67
006166  100003                  BPL     SOPB
006170  005277  000012          INC     @SOPXAD         ;INC SOPX W/MODE 77
006174  001405                  BEQ     TS74

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 760              <====
006176                  SOPB:
006176  012742  000147          MOV     #147,-(R2)      ;MOVE TO MAILBOX #  *******  147  *******
006202  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006204  000000                  HALT                    ;INC DID NOT SET Z-BIT
                                                        ;  OR SEQUENCE ERROR
006206  006142          SOPXAD: SOPX                    ;INDIRECT ADDRESS OF SOPX
```

```
                              ;*******************************************************************************
                              ;
                              ;       THIS TEST VERIFIES SINGLE OPERAND NON-MODIFYING INSTRUCTIONS
                              ;USING MODE 0.  R0 IS SET TO ZERO AND THE CONDITION CODES ARE SET
                              ;TO THE COMPLEMENT OF THAT EXPECTED BY THE INSTRUCTION.  A TST INSTRUCTION
                              ;IS EXECUTED AND CONDITIONAL BRANCHES ARE USED TO TEST THE CONDITION
                              ;CODES.
                              ;
                              ;*******************************************************************************
                              ;TEST 74         TEST MODE 0 SOP NON-MODIFYING
                              ;*******************************************************************************
006210  005212                TS74:   INC     (R2)            ;UPDATE TEST NUMBER
006212  022712  000074                CMP     #74,(R2)        ;SEQUENCE ERROR?
006216  001010                        BNE     TS75-10         ;BR TO ERROR HALT ON SEQ ERROR
006220  005000                        CLR     R0              ;INITIALIZE R0=0
006222  000277                        SCC                     ;SET CC=1011
006224  000244                        CLZ
006226  005700                        TST     R0              ;TRY TST W/ MODE 0
006230  102403                        BVS     SNM0A           ;CHECK THAT CC=0100
006232  100402                        BMI     SNM0A
006234  103401                        BCS     SNM0A
006236  001404                        BEQ     TS75
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                              ;           CONDITIONAL BRANCH INST. AND   <====
                                                              ;           REPLACE THE MOVE INSTRUCTION   <====
                                                              ;           WHICH FOLLOWS W/ 767           <====
006240                        SNM0A:
006240  012742  000150                MOV     #150,-(R2)      ;MOVE TO MAILBOX # ******* 150 *******
006244  005242                        INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006246  000000                        HALT                    ;CONDITION CODES NOT SET PROPERLY
                                                              ;  OR SEQUENCE ERROR

                              ;*******************************************************************************
                              ;
                              ;       THIS TEST VERIFIES SINGLE OPERAND NON-MODIFYING BYTE INSTRUCTIONS WITH MODE 0.
                              ;R0 IS SET TO 377 AND COMPLEMENT OF THE EXPECTED CONDITION CODES
                              ;IS LOADED IN PSW.  A TSTB INSTRUCTION IS EXECUTED AND THE RESULTS
                              ;ARE CHECKED WITH SEVERAL CONDITIONAL BRANCH INSTRUCTIONS.
                              ;       THIS VERIFIES THAT THE PROPER BYTE WAS TESTED.
                              ;
                              ;*******************************************************************************
                              ;TEST 75         TEST MODE 0 EVEN BYTE W/ SOP NON-MODIFYING
                              ;*******************************************************************************
006250  005212                TS75:   INC     (R2)            ;UPDATE TEST NUMBER
006252  022712  000075                CMP     #75,(R2)        ;SEQUENCE ERROR?
006256  001010                        BNE     TS76-10         ;BR TO ERROR HALT ON SEQ ERROR
006260  005000                        CLR     R0              ;INITIALIZE
006262  105100                        COMB    R0              ;R0=377
006264  000277                        SCC                     ;SET CC=0111
006266  000250                        CLN
006270  105700                        TSTB    R0              ;TRY TST EVEN BYTE
006272  102402                        BVS     SNMB0A          ;CHECK CC=1000
006274  101401                        BLOS    SNMB0A
006276  100404                        BMI     TS76
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
```

```
                                                              ;                 CONDITIONAL BRANCH INST. AND   <====
                                                              ;                 REPLACE THE MOVE INSTRUCTION   <====
                                                              ;                 WHICH FOLLOWS W/ 767           <====
     006300                             SNMB0A:
     006300  012742  000151                     MOV     #151,-(R2)    ;MOVE TO MAILBOX #  *******  151  *******
     006304  005242                             INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
     006306  000000                             HALT                  ;CONDITION CODES NOT SET PROPERLY
                                                                      ;  OR SEQUENCE ERROR

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

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST SETS LOCATION 0 TO 377 AND THEN USES R0 TO TEST
                                        ;THE EVEN BYTE AND THE ODD BYTE USING SOP BYTE INSTRUCTIONS WITH MODE 1.
                                        ;AGAIN, CONDITIONAL BRANCHES ARE USED TO VERIFY THE SETTING OF THE
                                        ;PROPER CONDITION CODE BITS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 77        TEST MODE 1 BYTE INST. NON-MODIFYING
                                        ;*******************************************************************************
     006352  005212                     TS77:   INC     (R2)          ;UPDATE TEST NUMBER
     006354  022712  000077                     CMP     #77,(R2)      ;SEQUENCE ERROR?
     006360  001026                             BNE     TS100-10      ;BR TO ERROR HALT ON SEQ ERROR
     006362  005000                             CLR     R0            ;POINT TO LOC 0
```

```
006364  005010                  CLR     (R0)                    ;CLEAR LOC 0
006366  105110                  COMB    (R0)                    ;COMPLEMENT BYTE 0
006370  000277                  SCC                             ;SET CC=0111
006372  000250                  CLN
006374  105710                  TSTB    (R0)                    ;TRY TST ON EVEN BYTE
006376  102402                  BVS     SNMB1A
006400  101401                  BLOS    SNMB1A
006402  100404                  BMI     SNMB1B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;          CONDITIONAL BRANCH INST. AND   <====
                                                                ;          REPLACE THE MOVE INSTRUCTION   <====
                                                                ;          WHICH FOLLOWS W/ 766           <====
006404                          SNMB1A:
006404  012742  000153                  MOV     #153,-(R2)      ;MOVE TO MAILBOX #  *******  153  *******
006410  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006412  000000                          HALT                    ;CC'S NOT CORRECT
006414  005000                  SNMB1B: CLR     R0
006416  005200                          INC     R0
006420  000277                          SCC                     ;SET CC=1011
006422  000244                          CLZ
006424  105710                          TSTB    (R0)            ;TRY TO TST AN ODD BYTE
006426  102403                          BVS     SNMB1C          ;CHECK CC=0100
006430  103402                          BCS     SNMB1C
006432  100401                          BMI     SNMB1C
006434  001404                          BEQ     TS100
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;          CONDITIONAL BRANCH INST. AND   <====
                                                                ;          REPLACE THE MOVE INSTRUCTION   <====
                                                                ;          WHICH FOLLOWS W/ 751           <====
006436                          SNMB1C:
006436  012742  000154                  MOV     #154,-(R2)      ;MOVE TO MAILBOX #  *******  154  *******
006442  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006444  000000                          HALT                    ;CC'S NOT CORRECT
                                                                ;  OR SEQUENCE ERROR

                        ;*************************************************************************************
                        ;
                        ;       THIS TEST VERIFIES THE SINGLE-OPERAND NON-MODIFYING INSTRUCTIONS
                        ;USING MODE 2.  IT USES THE IDENTICAL PROCEDURE EMPLOYED IN THE
                        ;MODE 1 TESTS.  ADDITIONALLY, THE REGISTER IS CHECKED TO ASSURE THAT
                        ;IT IS INCREMENTED PROPERLY.
                        ;
                        ;*************************************************************************************
                        ;TEST 100       TEST MODE 2 WITH SOP NON-MODIFYING
                        ;*************************************************************************************
006446  005212                  TS100:  INC     (R2)            ;UPDATE TEST NUMBER
006450  022712  000100                  CMP     #100,(R2)       ;SEQUENCE ERROR?
006454  001020                          BNE     TS101-10        ;BR TO ERROR HALT ON SEQ ERROR
006456  005000                          CLR     R0              ;INITIALIZE R0=0
006460  005010                          CLR     (R0)            ;CLEAR LOC 0
006462  000277                          SCC                     ;SET CC=1011
006464  000244                          CLZ
006466  005720                          TST     (R0)+           ;TRY TST W/ MODE 2
006470  102403                          BVS     SNM2A           ;CHECK CC=0100
006472  103402                          BCS     SNM2A
006474  100401                          BMI     SNM2A
```

```
006476 001404                   BEQ     SNM2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 766            <====
006500                          SNM2A:
006500 012742 000155            MOV     #155,-(R2)      ;MOVE TO MAILBOX #  *******  155  *******
006504 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006506 000000                   HALT                    ;CC'S NOT CORRECT
006510 005300           SNM2B:  DEC     R0              ;RESET R0
006512 005300                   DEC     R0
006514 001404                   BEQ     TS101
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 757            <====
006516 012742 000156            MOV     #156,-(R2)      ;MOVE TO MAILBOX #  *******  156  *******
006522 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006524 000000                   HALT                    ;MODE 2 DID NOT INC 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
                        ;**************************************************************************
006526 005212           TS101:  INC     (R2)            ;UPDATE TEST NUMBER
006530 022712 000101            CMP     #101,(R2)       ;SEQUENCE ERROR?
006534 001042                   BNE     TS102-10        ;BR TO ERROR HALT ON SEQ ERROR
006536 005000                   CLR     R0              ;CLEAR R0
006540 005010                   CLR     (R0)            ;CLEAR LOC 0
006542 105110                   COMB    (R0)            ;SET LOC 0=377
006544 000277                   SCC                     ;SET CC=0111
006546 000250                   CLN
006550 105720                   TSTB    (R0)+           ;TRY TST OF EVEN BYTE
006552 102402                   BVS     SNMB2A
006554 101401                   BLOS    SNMB2A
006556 100404                   BMI     SNMB2B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 766            <====
006560                          SNMB2A:
006560 012742 000157            MOV     #157,-(R2)      ;MOVE TO MAILBOX #  *******  157  *******
006564 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006566 000000                   HALT                    ;CC'S NOT SET CORRECTLY
006570 005300           SNMB2B: DEC     R0              ;DECREMENT R0
006572 001404                   BEQ     SNMB2C
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
```

```
                                                          ;               REPLACE THE MOVE INSTRUCTION   <====
                                                          ;               WHICH FOLLOWS W/ 760           <====
006574  012742  000160             MOV     #160,-(R2)     ;MOVE TO MAILBOX #  *******  160  *******
006600  005242                     INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
006602  000000                     HALT                   ;MODE 2 DID NOT INC REG CORRECTLY
006604  005200             SNMB2C: INC     R0             ;POINT TO ODD BYTE
006606  000277                     SCC                    ;SET CC=1011
006610  000244                     CLZ
006612  105720                     TSTB    (R0)+          ;TRY TST OF ODD BYTE
006614  102403                     BVS     SNMB2D         ;CHECK CC'S=0100
006616  103402                     BCS     SNMB2D
006620  100401                     BMI     SNMB2D
006622  001404                     BEQ     SNMB2E
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 744             <====
006624                     SNMB2D:
006624  012742  000161             MOV     #161,-(R2)     ;MOVE TO MAILBOX #  *******  161  *******
006630  005242                     INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
006632  000000                     HALT                   ;CC'S NOT CORRECT
006634  005300             SNMB2E: DEC     R0
006636  005300                     DEC     R0
006640  001404                     BEQ     TS102
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 735             <====
006642  012742  000162             MOV     #162,-(R2)     ;MOVE TO MAILBOX #  *******  162  *******
006646  005242                     INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
006650  000000                     HALT                   ;R0 DID NOT INCREMENT PROPERLY
                                                          ;  OR SEQUENCE ERROR

                           ;*******************************************************************************
                           ;
                           ;          THIS TEST VERIFIES MODE 3 SINGLE OPERAND NON-MODIFYING INSTRUCTIONS.
                           ;A POINTER IN A TABLE AT LOC. 376 IS USED TO TEST LOCATION 0.
                           ;THE CC'S AND THE REGISTER ARE CHECKED FOLLOWING THE
                           ;TST MODE 3 INSTRUCTION.
                           ;
                           ;*******************************************************************************
                           ;TEST 102          TEST MODE 3 W/ SOP NON-MODIFYING INSTS
                           ;*******************************************************************************
006652  005212             TS102:  INC     (R2)           ;UPDATE TEST NUMBER
006654  022712  000102             CMP     #102,(R2)      ;SEQUENCE ERROR?
006660  001022                     BNE     TS103-10       ;BR TO ERROR HALT ON SEQ ERROR
006662  005000                     CLR     R0             ;R0=0
006664  005010                     CLR     (R0)           ;CLEAR LOC 0
006666  105100                     COMB    R0             ;R0=376
006670  005300                     DEC     R0
006672  000277                     SCC                    ;SET CC=1011
006674  000244                     CLZ
006676  005730                     TST     @(R0)+         ;TRY TST W/ MODE 3
006700  102403                     BVS     SNM3A          ;CHECK CC=0100
006702  103402                     BCS     SNM3A
006704  100401                     BMI     SNM3A
```

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006706  001404                    BEQ     SNM3B
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 764             <====
006710                    SNM3A:
006710  012742  000163            MOV     #163,-(R2)      ;MOVE TO MAILBOX #  *******  163  *******
006714  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006716  000000                    HALT                    ;CC'S NOT CORRECT
006720  005300            SNM3B:  DEC     R0              ;R0=377
006722  105100                    COMB    R0              ;R0=0
006724  001404                    BEQ     TS103
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 755             <====
006726  012742  000164            MOV     #164,-(R2)      ;MOVE TO MAILBOX #  *******  164  *******
006732  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
006734  000000                    HALT                    ;MODE 3 DID NOT INC REG CORRECTLY
                                                          ;  OR SEQUENCE ERROR

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

```
007006  000277                  SNMB3B: SCC                             ;SET CC=1011
007010  000244                          CLZ
007012  105730                          TSTB    @(R0)+                  ;TRY TST OF ODD BYTE
007014  102403                          BVS     SNMB3C                  ;CHECK CC=0100
007016  103402                          BCS     SNMB3C
007020  100401                          BMI     SNMB3C
007022  001404                          BEQ     SNMB3D
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 750            <====
007024                          SNMB3C:
007024  012742  000166                  MOV     #166,-(R2)              ;MOVE TO MAILBOX #  *******  166  *******
007030  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
007032  000000                          HALT                            ;CC'S NOT CORRECT
007034  005720                  SNMB3D: TST     (R0)+                   ;R0=410
007036  005710                          TST     (R0)
007040  100404                          BMI     TS104
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 741            <====
007042  012742  000167                  MOV     #167,-(R2)              ;MOVE TO MAILBOX #  *******  167  *******
007046  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
007050  000000                          HALT                            ;TSTB DID NOT INCREMENT R0 CORRETCLY
                                                                        ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 4 SOP NON-MODIFYING INSTRUCTIONS.
                                ;LOC. 0 IS SET TO -1 AND THE CC'S ARE SET TO THE COMPLEMENT OF THE
                                ;EXPECTED RESULTS.  R0 AND SET TO 2 AND A TST MODE 4 IS EXECUTED.
                                ;THE CC'S ARE CHECKED WITH CONDITIONAL BRANCH INSTRUCTIONS AND THE REGISTER
                                ;IS CHECKED FOR PROPER DECREMENTING.
                                ;
                                ;*******************************************************************************
                                ;TEST 104       TEST MODE 4 W/ SOP NON-MODIFYING INSTS
                                ;*******************************************************************************
007052  005212                  TS104:  INC     (R2)                    ;UPDATE TEST NUMBER
007054  022712  000104                  CMP     #104,(R2)               ;SEQUENCE ERROR?
007060  001017                          BNE     TS105-10                ;BR TO ERROR HALT ON SEQ ERROR
007062  005000                          CLR     R0                      ;R0=0
007064  005010                          CLR     (R0)                    ;LOC 0=0
007066  005120                          COM     (R0)+                   ;LOC 0=-1
007070  000277                          SCC                             ;SET CC=1011
007072  000244                          CLZ
007074  005740                          TST     -(R0)                   ;TRY TST W/ MODE 4
007076  102402                          BVS     SNM4A                   ;CHECK CC=0100
007100  101401                          BLOS    SNM4A
007102  100404                          BMI     SNM4B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
007104                          SNM4A:
007104  012742  000170                  MOV     #170,-(R2)              ;MOVE TO MAILBOX #  *******  170  *******
007110  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
```

```
007112  000000                          HALT                    ;CC'S NOT CORRECT
007114  005700                  SNM4B:  TST     R0
007116  001404                          BEQ     TS105
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 760             <====
007120  012742  000171                  MOV     #171,-(R2)      ;MOVE TO MAILBOX #  *******  171  *******
007124  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007126  000000                          HALT                    ;TST MODE 4 DID NOT DEC R0 CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 5 SOP NON-MODIFYING INSTRUCTIONS.
                                ;IT USES A POINTER AT LOC. 376 TO TEST LOC. 0.  R0 IS SET
                                ;TO 400, A TST MODE 5 INSTRUCTION IS EXECUTED AND THE CC'S CHECKED.
                                ;R0 IS CHECKED TO INSURE PROPER DECREMENTING.
                                ;
                                ;*******************************************************************************
                                ;TEST 105       TEST MODE 5 W/ SOP NON-MODIFYING INSTS
                                ;*******************************************************************************
007130  005212                  TS105:  INC     (R2)            ;UPDATE TEST NUMBER
007132  022712  000105                  CMP     #105,(R2)       ;SEQUENCE ERROR?
007136  001022                          BNE     TS106-10        ;BR TO ERROR HALT ON SEQ ERROR
007140  005000                          CLR     R0              ;R0=0
007142  005010                          CLR     (R0)            ;LOC 0=0
007144  005110                          COM     (R0)            ;LOC 0=-1
007146  105100                          COMB    R0              ;R0=377
007150  005200                          INC     R0              ;R0=400
007152  000277                          SCC                     ;SET CC=0111
007154  000250                          CLN
007156  005750                          TST     @-(R0)          ;TRY TST W/ MODE 5
007160  102402                          BVS     SNM5A           ;CHECK CC=1000
007162  101401                          BLOS    SNM5A
007164  100404                          BMI     SNM5B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 764             <====
007166                          SNM5A:
007166  012742  000172                  MOV     #172,-(R2)      ;MOVE TO MAILBOX #  *******  172  *******
007172  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007174  000000                          HALT                    ;CC'S NOT SET PROPERLY
007176  005200                  SNM5B:  INC     R0              ;R0=377
007200  105100                          COMB    R0              ;R0=0
007202  001404                          BEQ     TS106
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 755             <====
007204  012742  000173                  MOV     #173,-(R2)      ;MOVE TO MAILBOX #  *******  173  *******
007210  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007212  000000                          HALT                    ;MODE 5 DID NOT DEC R0 CORRECTLY
                                                                ;  OR SEQUENCE ERROR
```

```
                                  ;*******************************************************************************
                                  ;
                                  ;         THIS TEST VERIFIES MODE 6 SOP NON-MODIFYING INSTRUCTIONS.
                                  ;R0 IS SET TO 377 AND A MODE 6 TST INSTRUCTION IS EXECUTED
                                  ;USING R0 AND AN OFFSET OF -377.  THE CC'S ARE CHECKED AS WELL
                                  ;AS R0 TO INSURE IT WAS NOT ALTERED.
                                  ;
                                  ;*******************************************************************************
                                  ;TEST 106        TEST MODE 6 W/ SOP NON-MODIFYING INSTS
                                  ;*******************************************************************************
 007214  005212                   TS106:  INC     (R2)                    ;UPDATE TEST NUMBER
 007216  022712  000106                   CMP     #106,(R2)               ;SEQUENCE ERROR?
 007222  001021                           BNE     TS107-10                ;BR TO ERROR HALT ON SEQ ERROR
 007224  005000                           CLR     R0                      ;R0=0
 007226  005010                           CLR     (R0)                    ;LOC 0=0
 007230  005110                           COM     (R0)                    ;LOC 0=-1
 007232  105100                           COMB    R0                      ;R0=377
 007234  000277                           SCC                             ;SET CC=0111
 007236  000250                           CLN
 007240  005760  177401                   TST     -377(R0)                ;TRY TST W/ MODE 6
 007244  102402                           BVS     SNM6A                   ;CHECK CC=1000
 007246  101401                           BLOS    SNM6A
 007250  100404                           BMI     SNM6B
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                          ;           WHICH FOLLOWS W/ 764             <====
 007252                           SNM6A:
 007252  012742  000174                   MOV     #174,-(R2)              ;MOVE TO MAILBOX #  *******  174  *******
 007256  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
 007260  000000                           HALT                            ;CC'S INCORRECT
 007262  105100                   SNM6B:  COMB    R0                      ;R0=0
 007264  001404                           BEQ     TS107
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                          ;           WHICH FOLLOWS W/ 756             <====
 007266  012742  000175                   MOV     #175,-(R2)              ;MOVE TO MAILBOX #  *******  175  *******
 007272  005242                           INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
 007274  000000                           HALT                            ;TST MODE 6 INCORRECTLY CHANGED R0
                                                                          ;  OR SEQUENCE ERROR



                                  ;*******************************************************************************
                                  ;
                                  ;         THIS TEST VERIFIES MODE 7 SOP NON-MODIFYING INSTRUCTIONS.
                                  ;IT USES A POINTER TO LOC. 0 STORED AT LOC. 400 TO TST LOC. 0.
                                  ;R0 IS SET TO 377 AND LOC. 0 IS TESTED THRU THE POINTER AT 400 USING
                                  ;R0 AND AN OFFSET OF 1.
                                  ;
                                  ;*******************************************************************************
                                  ;TEST 107        TEST MODE 7 W/ SOP NON-MODIFYING INSTS.
                                  ;*******************************************************************************
 007276  005212                   TS107:  INC     (R2)                    ;UPDATE TEST NUMBER
 007300  022712  000107                   CMP     #107,(R2)               ;SEQUENCE ERROR?
 007304  001021                           BNE     TS110-10                ;BR TO ERROR HALT ON SEQ ERROR
```

```
007306  005000                          CLR     R0              ;R0=0
007310  005010                          CLR     (R0)            ;LOC 0=0
007312  005110                          COM     (R0)            ;LOC 0=-1
007314  105100                          COMB    R0              ;R0=377
007316  000277                          SCC                     ;CC=0111
007320  000250                          CLN
007322  005770  000001                  TST     @1(R0)          ;TRY TST W/ MODE 7
007326  102402                          BVS     SNM7A           ;CHECK CC=1000
007330  101401                          BLOS    SNM7A
007332  100404                          BMI     SNM7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND    <====
                                                                ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                ;          WHICH FOLLOWS W/ 764            <====
007334                          SNM7A:
007334  012742  000176                  MOV     #176,-(R2)      ;MOVE TO MAILBOX #  *******  176  *******
007340  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007342  000000                          HALT                    ;CC'S NOT CORRECT
007344  105100                  SNM7B:  COMB    R0              ;R0=0
007346  001404                          BEQ     TS110
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;          CONDITIONAL BRANCH INST. AND    <====
                                                                ;          REPLACE THE MOVE INSTRUCTION    <====
                                                                ;          WHICH FOLLOWS W/ 756            <====
007350  012742  000177                  MOV     #177,-(R2)      ;MOVE TO MAILBOX #  *******  177  *******
007354  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007356  000000                          HALT                    ;TST MODE 7 INCORRECTLY CHANGED R0
                                                                ;  OR SEQUENCE ERROR



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

```

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


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

```
                                                          ;               REPLACE THE MOVE INSTRUCTION   <====
                                                          ;               WHICH FOLLOWS W/ 761           <====
007514  012742  000203            MOV     #203,-(R2)      ;MOVE TO MAILBOX #  *******  203  *******
007520  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007522  000000                    HALT                    ;DATA RESULT OF SUB FAILED
                                                          ;  OR SEQUENCE ERROR



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

```
007616  005000                  DOPOC:  CLR     R0              ;R0=0
007620  105100                          COMB    R0              ;R0=377
007622  005004                          CLR     R4              ;R4=0
007624  005104                          COM     R4              ;R4=177777
007626  040004                          BIC     R0,R4           ;R4=177400
007630  060004                          ADD     R0,R4           ;TRY ADD: R4=177777
007632  005204                          INC     R4              ;R4=0
007634  001404                          BEQ     DOPOD
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 736            <====
007636  012742  000207                  MOV     #207,-(R2)      ;MOVE TO MAILBOX #  *******  207  *******
007642  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007644  000000                          HALT                    ;RESULT OF ADD INCORRECT
007646  160004                  DOPOD:  SUB     R0,R4           ;177401=R4
007650  105404                          NEGB    R4              ;R4=177777
007652  005204                          INC     R4              ;RD=0
007654  001404                          BEQ     TS114
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 726            <====
007656  012742  000210                  MOV     #210,-(R2)      ;MOVE TO MAILBOX #  *******  210  *******
007662  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007664  000000                          HALT                    ;RESULT OF SUB INCORRECT
                                                                ;  OR SEQUENCE ERROR



                                ;*******************************************************************************
                                ;
                                ;               THIS TEST VERIFIES MODE 0,X DOUBLE OPERAND INSTRUCTIONS.  IT SETS
                                ;DATA IN R0 AND LOCATION 0 AND OPERATES UPON IT USING DOP INSTRUCTIONS.
                                ;
                                ;*******************************************************************************
                                ;TEST 114       TEST MODE 0,X DOUBLE-OPERAND INSTRUCTIONS
                                ;*******************************************************************************
007666  005212                  TS114:  INC     (R2)            ;UPDATE TEST NUMBER
007670  022712  000114                  CMP     #114,(R2)       ;SEQUENCE ERROR?
007674  001024                          BNE     TS115-10        ;BR TO ERROR HALT ON SEQ ERROR
007676  005000                          CLR     R0              ;R0=0
007700  005010                          CLR     (R0)            ;LOC. 0=0
007702  105110                          COMB    (R0)            ;LOC. 0=377
007704  005220                          INC     (R0)+           ;LOC. 0=400    R0=2
007706  005400                          NEG     R0              ;R0=-2
007710  060037  000000                  ADD     R0,@#0          ;TRY ADD 0,3;  LOC. 0=376
007714  100403                          BMI     DOP03A          ;CC=0001?
007716  001402                          BEQ     DOP03A
007720  102401                          BVS     DOP03A
007722  103404                          BCS     DOP03B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 764            <====
007724                          DOP03A:
007724  012742  000211                  MOV     #211,-(R2)      ;MOVE TO MAILBOX #  *******  211  *******
```

```
007730  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007732  000000                          HALT                    ;CC'S NOT SET CORRECTLY
007734  105137  000000          DOP03B: COMB    @#0             ;LOC. 0=1
007740  005337  000000                  DEC     @#0             ;LOC. 0=0
007744  001404                          BEQ     TS115
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 753            <====
007746  012742  000212                  MOV     #212,-(R2)      ;MOVE TO MAILBOX #  *******  212  *******
007752  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
007754  000000                          HALT                    ;DATA RESULT INCORRECT
                                                                ;  OR SEQUENCE ERROR

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

```
010040 000000                   HALT                    ;CC'S NOT CORRECT (Z=1) FOR CMP
010042 005000           DNM3:   CLR     R0              ;R0=0
010044 005100                   COM     R0              ;R0=177777
010046 005004                   CLR     R4              ;R4=0
010050 030004                   BIT     R0,R4           ;TRY BIT R0 TO R4
010052 001404                   BEQ     DNM4

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 744            <====
010054 012742 000216            MOV     #216,-(R2)      ;MOVE TO MAILBOX #  *******  216  *******
010060 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010062 000000                   HALT                    ;CC'S NOT CORRECT FOR BIT
010064 005304           DNM4:   DEC     R4              ;R4=177777
010066 030004                   BIT     R0,R4           ;TRY BIT AGAIN
010070 100404                   BMI     TS116

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 735            <====
010072 012742 000217            MOV     #217,-(R2)      ;MOVE TO MAILBOX #  *******  217  *******
010076 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010100 000000                   HALT                    ;CC'S NOT CORRECT FOR BIT
                                                        ;  OR SEQUENCE ERROR
                        ;*****************************************************************************
                        ;
                        ;       THIS TEST VERIFIES MODE 0,X DOUBLE OPERAND NON-MODIFYING INSTRUCTIONS.
                        ;IT SETS DATA IN R0 AND LOCATION 0 AND COMPARES THEM USING DOPNM INSTRUCTIONS.
                        ;
                        ;*****************************************************************************
                        ;TEST 116       TEST MODE 0,X DOUBLE-OPERAND NON-MODIFYING INSTS.
                        ;*****************************************************************************
010102 005212           TS116:  INC     (R2)            ;UPDATE TEST NUMBER
010104 022712 000116            CMP     #116,(R2)       ;SEQUENCE ERROR?
010110 001022                   BNE     TS117-10        ;BR TO ERROR HALT ON SEQ ERROR
010112 005000                   CLR     R0              ;R0=0
010114 005010                   CLR     (R0)            ;LOC. 0=0
010116 005110                   COM     (R0)            ;LOC. 0=177777
010120 005200                   INC     R0              ;R0=1
010122 020037 000000            CMP     R0,@#0          ;TRY CMP MODE 0,3
010126 100403                   BMI     DNM03A          ;CC=0001
010130 001402                   BEQ     DNM03A
010132 102401                   BVS     DNM03A
010134 103404                   BCS     DNM03B

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 765            <====
010136                  DNM03A:
010136 012742 000220            MOV     #220,-(R2)      ;MOVE TO MAILBOX #  *******  220  *******
010142 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010144 000000                   HALT                    ;CC'S NOT SET CORRECTLY
010146 005300           DNM03B: DEC     R0
010150 001002                   BNE     DNM03C
010152 005210                   INC     (R0)
010154 001404                   BEQ     TS117
```

```
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 755            <====
010156                          DNM03C:
010156  012742  000221                  MOV     #221,-(R2)      ;MOVE TO MAILBOX #  *******  221  *******
010162  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010164  000000                          HALT                    ;DATA INCORRECTLY MODIFIED BY CMP
                                                                ;  OR SEQUENCE ERROR

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


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 1 DOP BYTE INSTRUCTIONS WHICH ADDRESS
                                ;EVEN BYTES.  LOC. 0 IS SET TO -1 AND R4 IS CLEARED.  THEN R4 IS
                                ;SET TO -1 USING A BISB THRU R0 WITH MODE 1.
                                ;
                                ;*******************************************************************************
                                ;TEST 120       TEST MODE 1 - EVEN BYTE W/ DOP INSTS.
                                ;*******************************************************************************
010224  005212                  TS120:  INC     (R2)            ;UPDATE TEST NUMBER
010226  022712  000120                  CMP     #120,(R2)       ;SEQUENCE ERROR?
010232  001007                          BNE     TS121-10        ;BR TO ERROR HALT ON SEQ ERROR
010234  005000                          CLR     R0              ;R0=0
010236  005010                          CLR     (R0)            ;LOC. 0=0
010240  005110                          COM     (R0)            ;LOC. 0=177777
010242  005004                          CLR     R4              ;R4=0
```

```
010244  151004                    BISB    (R0),R4         ;TRY MODE 1- EVEN BYTE W/ DOP
010246  105104                    COMB    R4              ;R4=0
010250  001404                    BEQ     TS121
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                          ;           CONDITIONAL BRANCH INST. AND   <====
                                                          ;           REPLACE THE MOVE INSTRUCTION   <====
                                                          ;           WHICH FOLLOWS W/ 770           <====
010252  012742  000223            MOV     #223,-(R2)      ;MOVE TO MAILBOX #  *******  223  *******
010256  005242                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010260  000000                    HALT                    ;RESULT OF BISB IS INCORRECT
                                                          ;  OR SEQUENCE ERROR



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



                          ;*******************************************************************************
                          ;
                          ;       THIS TEST VERIFIES MODE 1,0 MOVB INSTRUCTIONS
                          ;WHICH ADDRESS EVEN BYTES.  LOC. 0 IS SET TO 177400, R0 IS CLEARED AND
                          ;R4 IS SET TO -1.  MOVB ARE USED TO MOVE BYTE 0 TO R4.  THIS
                          ;VERIFIES THAT THE PROPER BYTE WAS SELECTED AND THAT THE SIGN-X-TEND
                          ;FUNCTION WITH MODE 0.
                          ;       THEN LOC. 0 IS COMPLEMENTED AND THE SAME PROCEDURE EXERCISES
                          ;THE LOGIC FOR COMPLEMENTARY DATA.
                          ;       THIS TEST EXERCISES UNIQUE MICROCODE.
                          ;
                          ;*******************************************************************************
                          ;TEST 122       TEST MOV INSTRUCTION MODE 1,0 EVEN BYTE
```

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



                                ;*****************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 1 DOP INSTRUCTIONS WHICH REFERENCE
                                ;ODD BYTES.  LOC. 0 IS SET TO 177400.  R0 IS SET TO 0 AND R4 IS
                                ;SET TO 1.  THE BISB INSTRUCTION USES THE DATA IN BYTE 1 TO SET BYTE 0.
                                ;THE RESULT IS CHECKED BY INCREMENTING THE WORD (LOC. 0) TO ZERO.
                                ;
                                ;*****************************************************************************
                                ;TEST 123       TEST MODE 1-ODD BYTE W/ DOP INSTS.
                                ;*****************************************************************************
010400  005212          TS123:  INC     (R2)            ;UPDATE TEST NUMBER
010402  022712  000123          CMP     #123,(R2)       ;SEQUENCE ERROR?
010406  001010                  BNE     TS124-10        ;BR TO ERROR HALT ON SEQ ERROR
010410  005000                  CLR     R0              ;R0=0
010412  005010                  CLR     (R0)            ;LOC. 0=0
010414  005004                  CLR     R4              ;R4=0
010416  005204                  INC     R4              ;R4=1
010420  105114                  COMB    (R4)            ;LOC. 0=177400
010422  151410                  BISB    (R4),(R0)       ;TRY TO BIS LOW ORDER BITS W/ MODE 1
```

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010424  005210                  INC     (R0)            ;CHECK RESULT
010426  001404                  BEQ     TS124
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                        ;           WHICH FOLLOWS W/ 767            <====
010430  012742  000227          MOV     #227,-(R2)      ;MOVE TO MAILBOX # ******* 227 *******
010434  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010436  000000                  HALT                    ;RESULT OF BISB INCORRECT
                                                        ;  OR SEQUENCE ERROR



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



                        ;*******************************************************************************
                        ;
                        ;       THIS TEST VERIFIES MODE 2 DOP BYTE INSTRUCTIONS WHICH ADDRESS
                        ;EVEN BYTES.  LOC. 0 IS SET TO -1.  R0 IS CLEARED AND USED AS THE
                        ;ADDRESSING REGISTER IN A TEST WHICH TRIES TO CLEAR BYTE 1 USING
```

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

                                ;*******************************************************************************
                                ;
                                ;
                                ;       THIS TEST VERIFIES MODE 2 DOP BYTE INSTRUCTIONS WHICH REFERENCE
                                ;ODD BYTES.  R0 IS SET TO 1, LOC. 0 IS SET TO 177400, AND R4 IS CLEARED.
                                ;A MODE 2 MOVB USES R0 TO MOVE BYTE 1 TO R4.  AN INCREMENT
                                ;IS USED TO CHECK THAT THE PROPER BYTE WAS MOVED AND SIGN X-TENDED.
                                ;
                                ;*******************************************************************************
                                ;TEST 126         TEST MODE 2 - ODD BYTE W/ DOP INST.
                                ;*******************************************************************************
010566  005212                  TS126:  INC     (R2)            ;UPDATE TEST NUMBER
010570  022712  000126                  CMP     #126,(R2)       ;SEQUENCE ERROR?
010574  001017                          BNE     TS127-10        ;BR TO ERROR HALT ON SEQ ERROR
010576  005000                          CLR     R0              ;R0=0
010600  005004                          CLR     R4              ;R4=0
010602  005010                          CLR     (R0)            ;LOC. 0=0
010604  005110                          COM     (R0)            ;LOC. 0=177777
010606  105120                          COMB    (R0)+           ;LOC 0=177400; R0=1
010610  112004                          MOVB    (R0)+,R4        ;TRY DOP MODE 2 W/ ODD BYTE
010612  005204                          INC     R4              ;CHECK RESULT OF MOVB
010614  001404                          BEQ     DOPB2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
```

```
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 767             <====
010616  012742  000234                  MOV     #234,-(R2)      ;MOVE TO MAILBOX #  *******  234  *******
010622  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010624  000000                          HALT                    ;RESULT OF MOVB INCORRECT
010626  005740                  DOPB2B: TST     -(R0)           ;BUMP R0 DOWN BY 2
010630  005700                          TST     R0              ;CHECK R0
010632  001404                          BEQ     TS127
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                                ;               CONDITIONAL BRANCH INST. AND     <====
                                                                ;               REPLACE THE MOVE INSTRUCTION     <====
                                                                ;               WHICH FOLLOWS W/ 760             <====
010634  012742  000235                  MOV     #235,-(R2)      ;MOVE TO MAILBOX #  *******  235  *******
010640  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010642  000000                          HALT                    ;MODE 2 BYTE DID NOT INCREMENT REG. CORRECTLY
                                                                ;  OR SEQUENCE ERROR

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

```
010710  022712  000130                  CMP     #130,(R2)       ;SEQUENCE ERROR?
010714  001011                          BNE     TS131-10        ;BR TO ERROR HALT ON SEQ ERROR
010716  012737  052652  000000          MOV     #52652,@#0      ;NOVE 1'S AND 0' PATTERN TO LOC. 0
010724  005000                          CLR     R0              ;R0=0
010726  153700  000000                  BISB    @#0,R0          ;TRY R0=252 W/ MODE 3 - EVEN BYTE
010732  022700  000252                  CMP     #252,R0         ;BISB W/ EVEN BYTE SUCCESSFUL?
010736  001404                          BEQ     TS131
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
010740  012742  000237                  MOV     #237,-(R2)      ;MOVE TO MAILBOX #  *******  237  *******
010744  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
010746  000000                          HALT                    ;BISB W/ MODE 3 - EVEN BYTE FAILED
                                                                ;  OR SEQUENCE ERROR


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


                                ;*******************************************************************************
                                ;TEST 132       TEST DEST. MODE 0-BYTE W/ DOP NON-MODIFYING MST
                                ;*******************************************************************************
011012  005212                  TS132:  INC     (R2)            ;UPDATE TEST NUMBER
011014  022712  000132                  CMP     #132,(R2)       ;SEQUENCE ERROR?
011020  001017                          BNE     TS133-10        ;BR TO ERROR HALT ON SEQ ERROR
011022  005000                          CLR     R0              ;R0=0
011024  105100                          COMB    R0              ;R0=377
011026  000263                          +SEC!SEV                ;SET C AND V BITS
011030  132700  000200                  BITB    #200,R0         ;TRY DOPNM DEST. MODE 0-BYTE
011034  001403                          BEQ     DNMB0A          ;BR TO ERROR IF Z BIT SET
011036  102402                          BVS     DNMB0A          ;BR TO ERROR IF V BIT SET
011040  103001                          BCC     DNMB0A          ;BR TO ERROR IF C BIT CLEAR.
```

```
011042  100404                          BMI     DNMB0B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 766             <====
011044                          DNMB0A:
011044  012742  000241                  MOV     #241,-(R2)      ;MOVE TO MAILBOX #  *******  241  *******
011050  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011052  000000                          HALT                    ;CC'S INCORRECT
011054  105100                  DNMB0B: COMB    R0              ;CHECK DESTINATION DATA
011056  001404                          BEQ     TS133
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 760             <====
011060  012742  000242                  MOV     #242,-(R2)      ;MOVE TO MAILBOX #  *******  242  *******
011064  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011066  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR

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

                                ;*******************************************************************************
                                ;TEST 134       TEST DEST, MODE 2 W/ DOP NON-MODIFYING INST.
                                ;*******************************************************************************
```

```
011146 005212                TS134:  INC     (R2)                    ;UPDATE TEST NUMBER
011150 022712 000134                 CMP     #134,(R2)               ;SEQUENCE ERROR?
011154 001027                        BNE     TS135-10                ;BR TO ERROR HALT ON SEQ ERROR
011156 005000                        CLR     R0                      ;R0=0
011160 005010                        CLR     (R0)                    ;LOC. 0=0
011162 052710 125252                 BIS     #125252,(R0)            ;LOC. 0=125252
011166 032720 077777                 BIT     #77777,(R0)+            ;TRY DOPNM INST W/ MODE 2
011172 102402                        BVS     DNM2A                   ;BR TO ERROR IF V BIT SET
011174 001401                        BEQ     DNM2A                   ;BR TO ERROR IF Z-BIT SET
011176 100004                        BPL     DNM2B
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                     ;           WHICH FOLLOWS W/ 766            <====
011200                       DNM2A:
011200 012742 000245                 MOV     #245,-(R2)              ;MOVE TO MAILBOX #  *******  245  *******
011204 005242                        INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011206 000000                        HALT                            ;COND. CODES INCORRECT
011210 005300                DNM2B:  DEC     R0                      ;DECREMENT R0 TO CHECK IT.
011212 005300                        DEC     R0
011214 001404                        BEQ     DNM2D
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                     ;           WHICH FOLLOWS W/ 757            <====
011216                       DNM2C:
011216 012742 000246                 MOV     #246,-(R2)              ;MOVE TO MAILBOX #  *******  246  *******
011222 005242                        INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011224 000000                        HALT                            ;MODE 2 REGISTER NOT INCREMENTED BY 2
011226 022710 125252         DNM2D:  CMP     #125252,(R0)            ;CHECK DEST. DATA
011232 001404                        BEQ     TS135
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                     ;           WHICH FOLLOWS W/ 750            <====
011234 012742 000247                 MOV     #247,-(R2)              ;MOVE TO MAILBOX #  *******  247  *******
011240 005242                        INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011242 000000                        HALT                            ;DEST. DATA MODIFIED
                                                                     ;  OR SEQUENCE ERROR

                             ;*******************************************************************************
                             ;TEST 135       TEST DEST. MODE 2-BYTE, W/DOP NON-MODIFYING INST
                             ;*******************************************************************************
011244 005212                TS135:  INC     (R2)                    ;UPDATE TEST NUMBER
011246 022712 000135                 CMP     #135,(R2)               ;SEQUENCE ERROR?
011252 001051                        BNE     TS136-10                ;BR TO ERROR HALT ON SEQ ERROR
011254 005000                        CLR     R0                      ;R0=0
011256 005010                        CLR     (R0)                    ;LOC. 0=0
011260 052710 052652                 BIS     #52652,(R0)             ;LOC. 0=52652
011264 000263                        +SEC!SEV                        ;SET C AND V BITS
011266 132720 000201                 BITB    #201,(R0)+              ;TRY DOPNM INST. W/ MODE 2 EVEN BYTE
011272 001403                        BEQ     DNMB2A                  ;BR TO ERROR IF Z-BIT SET
011274 103002                        BCC     DNMB2A                  ;BR TO ERROR IF C-BIT CLEAR
011276 102401                        BVS     DNMB2A                  ;BR TO ERROR IF V-BIT SET
011300 100404                        BMI     DNMB2B
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
```

```
                                                            ;               CONDITIONAL BRANCH INST. AND     <====
                                                            ;               REPLACE THE MOVE INSTRUCTION     <====
                                                            ;               WHICH FOLLOWS W/ 764             <====
011302                          DNMB2A:
011302  012742  000250                  MOV     #250,-(R2)  ;MOVE TO MAILBOX #  *******  250  *******
011306  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
011310  000000                          HALT                ;COND. CODES INCORRECT
011312  005300                  DNMB2B: DEC     R0          ;CHECK DEST. REGISTER.
011314  001404                          BEQ     DNMB2C
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;               CONDITIONAL BRANCH INST. AND     <====
                                                            ;               REPLACE THE MOVE INSTRUCTION     <====
                                                            ;               WHICH FOLLOWS W/ 756             <====
011316  012742  000251                  MOV     #251,-(R2)  ;MOVE TO MAILBOX #  *******  251  *******
011322  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
011324  000000                          HALT                ;DEST. REGISTER NOT INCREMENTED BY 1
011326  005200                  DNMB2C: INC     R0          ;R0=1
011330  132720  000201                  BITB    #201,(R0)+  ;TRY DOPNM INST. W/MODE 2-ODD BYTE
011334  001402                          BEQ     DNMB2D   ;BR TO ERROR IF Z-BIT SET
011336  102401                          BVS     DNMB2D      ;BR TO ERROR IF V-BIT SET
011340  100004                          BPL     DNMB2E
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;               CONDITIONAL BRANCH INST. AND     <====
                                                            ;               REPLACE THE MOVE INSTRUCTION     <====
                                                            ;               WHICH FOLLOWS W/ 744             <====
011342                          DNMB2D:
011342  012742  000252                  MOV     #252,-(R2)  ;MOVE TO MAILBOX #  *******  252  *******
011346  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
011350  000000                          HALT                ;COND. CODES INCORRECT
011352  005300                  DNMB2E: DEC     R0          ;DEC R0 TO CHECK IT.
011354  005300                          DEC     R0
011356  001404                          BEQ     DNMB2F
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;               CONDITIONAL BRANCH INST. AND     <====
                                                            ;               REPLACE THE MOVE INSTRUCTION     <====
                                                            ;               WHICH FOLLOWS W/ 735             <====
011360  012742  000253                  MOV     #253,-(R2)  ;MOVE TO MAILBOX #  *******  253  *******
011364  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
011366  000000                          HALT                ;DEST. REGISTER NOT INCREMENTED BY 1
011370  022710  052652          DNMB2F: CMP     #52652,(R0) ;CHECK DEST. DATA IS UNMODIFIED
011374  001404                          BEQ     TS136
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;               CONDITIONAL BRANCH INST. AND     <====
                                                            ;               REPLACE THE MOVE INSTRUCTION     <====
                                                            ;               WHICH FOLLOWS W/ 726             <====
011376  012742  000254                  MOV     #254,-(R2)  ;MOVE TO MAILBOX #  *******  254  *******
011402  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
011404  000000                          HALT                ;DEST. DATA WAS MODIFIED.
                                                            ;  OR SEQUENCE ERROR



                                ;*******************************************************************************
                                ;TEST 136       TEST DEST. MODE 3-BYTES W/DOP NON-MODIFYING INST.
                                ;*******************************************************************************
011406  005212                  TS136:  INC     (R2)        ;UPDATE TEST NUMBER
011410  022712  000136                  CMP     #136,(R2)   ;SEQUENCE ERROR?
```

```
011414  001050                          BNE     TS137-10        ;BR TO ERROR HALT ON SEQ ERROR
011416  005000                          CLR     R0              ;R0=0
011420  005010                          CLR     (R0)            ;LOC. 0=0
011422  052710  125125                  BIS     #125125,(R0)    ;LOC. 0=125125
011426  105100                          COMB    R0              ;R0=377
011430  005200                          INC     R0              ;R0=400
011432  005010                          CLR     (R0)            ;LOC. 400=0
011434  000263                          +SEC!SEV                ;C-BIT=V-BIT=1
011436  132730  000201                  BITB    #201,@(R0)+     ;TRY DOPNM W/MODE 3-EVEN BYTE
011442  001403                          BEQ     DNMB3A          ;BR TO ERROR IF Z BIT SET
011444  102402                          BVS     DNMB3A          ;BR TO ERROR IF V BIT SET
011446  103001                          BCC     DNMB3A          ;BR TO ERROR IF C BIT CLEAR
011450  100004                          BPL     DNMB3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 761             <====
011452                          DNMB3A:
011452  012742  000255                  MOV     #255,-(R2)      ;MOVE TO MAILBOX #  *******  255  *******
011456  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011460  000000                          HALT                    ;COND. CODES INCORRECT
011462  022700  000402          DNMB3B: CMP     #402,R0         ;CHECK DEST. REGISTER INC. BY 2 AND INC BY 2 AGAIN
011466  001404                          BEQ     DNMB3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 752             <====
011470  012742  000256                  MOV     #256,-(R2)      ;MOVE TO MAILBOX #  *******  256  *******
011474  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011476  000000                          HALT                    ;DEST. REGISTER NOT INCREMENTED BY 2
011500  005200                  DNMB3C: INC     R0              ;R0=404
011502  005200                          INC     R0
011504  132730  000201                  BITB    #201,@(R0)+     ;TRY DOPNM DEST MODE 3-BYTE(ODD)
011510  001402                          BEQ     DNMB3D          ;BR TO ERROR IF Z BIT SET
011512  102401                          BVS     DNMB3D          ;BR TO ERROR IF V BIT SET
011514  100404                          BMI     DNMB3E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 737             <====
011516                          DNMB3D:
011516  012742  000257                  MOV     #257,-(R2)      ;MOVE TO MAILBOX #  *******  257  *******
011522  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011524  000000                          HALT                    ;COND. CODES INCORRECT
011526  005004                  DNMB3E: CLR     R4              ;R4=0
011530  022714  125125                  CMP     #125125,(R4)    ;CHECK DEST. DATA
011534  001404                          BEQ     TS137
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS.    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 727             <====
011536  012742  000260                  MOV     #260,-(R2)      ;MOVE TO MAILBOX #  *******  260  *******
011542  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011544  000000                          HALT                    ;DEST. DATA MODIFIED
                                                                ;  OR SEQUENCE ERROR
```

```
                                        ;*************************************************************************
                                        ;TEST 137        TEST DEST. MODE 4 W/DOP NON-MODIFYING INST.
                                        ;*************************************************************************
011546  005212                          TS137:  INC     (R2)                    ;UPDATE TEST NUMBER
011550  022712  000137                          CMP     #137,(R2)               ;SEQUENCE ERROR?
011554  001033                                  BNE     TS140-10                ;BR TO ERROR HALT ON SEQ ERROR
011556  005000                                  CLR     R0                      ;R0=0
011560  005010                                  CLR     (R0)                    ;LOC. 0=0
011562  052710  125252                          BIS     #125252,(R0)            ;LOC. 0=125125
011566  052700  000002                          BIS     #2,R0                   ;R0=2
011572  000277                                  SCC                             ;SET ALL COND. CODE BITS
011574  032740  020000                          BIT     #20000,-(R0)            ;TRY DOPNM W/ MODE 4
011600  100403                                  BMI     DNM4A                   ;BR TO ERROR IF N-BIT SET
011602  102402                                  BVS     DNM4A                   ;BR TO ERROR IF V-BIT SET
011604  103001                                  BCC     DNM4A                   ;BR TO ERROR IF C-BIT CHAR
011606  001004                                  BNE     DNM4B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 762            <====
011610                                  DNM4A:
011610  012742  000261                          MOV     #261,-(R2)              ;MOVE TO MAILBOX #  *******  261  *******
011614  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011616  000000                                  HALT                            ;COND. CODES INCORRECT
011620  005700                          DNM4B:  TST     R0                      ;CHECK DEST. REGISTER
011622  001404                                  BEQ     DNM4C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 754            <====
011624  012742  000262                          MOV     #262,-(R2)              ;MOVE TO MAILBOX #  *******  262  *******
011630  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011632  000000                                  HALT                            ;DEST. REGISTER NOT DECREMENTED BY 2
011634  022737  125252  000000  DNM4C:  CMP     #125252,@#0             ;CHECK DEST. DATA
011642  001404                                  BEQ     TS140
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
011644  012742  000263                          MOV     #263,-(R2)              ;MOVE TO MAILBOX #  *******  263  *******
011650  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
011652  000000                                  HALT                            ;DEST. DATA MODIFIED
                                                                        ;  OR SEQUENCE ERROR

                                        ;*************************************************************************
                                        ;TEST 140        TEST DEST. MODE 4-BYTE W/ DOP NON-MODIFYING INST.
                                        ;*************************************************************************
011654  005212                          TS140:  INC     (R2)                    ;UPDATE TEST NUMBER
011656  022712  000140                          CMP     #140,(R2)               ;SEQUENCE ERROR?
011662  001051                                  BNE     TS141-10                ;BR TO ERROR HALT ON SEQ ERROR
011664  005000                                  CLR     R0                      ;R0=0
011666  005010                                  CLR     (R0)                    ;LOC. 0=0
011670  052710  052652                          BIS     #52652,(R0)             ;LOC. 0=52652
011674  052700  000002                          BIS     #2,R0                   ;R0=2
011700  000257                                  CCC                             ;COND. CODES=0
011702  132740  000201                          BITB    #201,-(R0)              ;TRY DOPNM INST W/MODE 4 ODD BYTE
```

```
011706  102403                      BVS     DNMB4A          ;BR TO ERROR IF V BIT SET
011710  001402                      BEQ     DNMB4A  ;BR TO ERROR IF Z BIT SET
011712  103401                      BCS     DNMB4A          ;BR TO ERROR IF C BIT SET
011714  001004                      BNE     DNMB4B
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 762             <====
011716                      DNMB4A:
011716  012742  000264              MOV     #264,-(R2)      ;MOVE TO MAILBOX #  *******  264  *******
011722  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011724  000000                      HALT                    ;COND. CODES INCORRECT
011726  022700  000001      DNMB4B: CMP     #1,R0           ;CHECK DEST. REGISTER
011732  001404                      BEQ     DNMB4C
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 753             <====
011734  012742  000265              MOV     #265,-(R2)      ;MOVE TO MAILBOX #  *******  265  *******
011740  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011742  000000                      HALT                    ;DEST REG. NOT DECREMENTED BY 1
011744  132740  000201      DNMB4C: BITB    #201,-(R0)      ;TRY DOPNM INST. W/MODE 4 EVEN BYTE
011750  001401                      BEQ     DNMB4D          ;BR TO ERROR IF Z-BIT SET
011752  100404                      BMI     DNMB4E
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 743             <====
011754                      DNMB4D:
011754  012742  000266              MOV     #266,-(R2)      ;MOVE TO MAILBOX #  *******  266  *******
011760  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011762  000000                      HALT                    ;COND. CODES INCORRECT
011764  005700              DNMB4E: TST     R0              ;CHECK DEST. REGISTER
011766  001404                      BEQ     DNMB4F
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 735             <====
011770  012742  000267              MOV     #267,-(R2)      ;MOVE TO MAILBOX #  *******  267  *******
011774  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
011776  000000                      HALT                    ;DEST. REG. NOT DECREMENTED BY 1
012000  022710  052652      DNMB4F: CMP     #52652,(R0)     ;CHECK DESTINATION DATA
012004  001404                      BEQ     TS141
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 726             <====
012006  012742  000270              MOV     #270,-(R2)      ;MOVE TO MAILBOX #  *******  270  *******
012012  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012014  000000                      HALT                    ;DEST. DATA MODIFIED
                                                            ;  OR SEQUENCE ERROR

                            ;*****************************************************************************
                            ;TEST 141       TEST DEST MODE 5 W/DOP NON-MODIFYING INST.
                            ;*****************************************************************************
012016  005212              TS141:  INC     (R2)            ;UPDATE TEST NUMBER
```

```
012020  022712  000141                  CMP     #141,(R2)          ;SEQUENCE ERROR?
012024  001034                          BNE     TS142-10           ;BR TO ERROR HALT ON SEQ ERROR
012026  005000                          CLR     R0                 ;R0=0
012030  005010                          CLR     (R0)               ;LOC 0=0
012032  052710  100000                  BIS     #100000,(R0)       ;LOC. 0=100000
012036  052700  000402                  BIS     #402,R0            ;R0=2
012042  000277                          SCC                        ;SET ALL COND. CODE BITS
012044  032750  100000                  BIT     #100000,@-(R0)     ;TRY DOPNM W/MODE 5
012050  102403                          BVS     DNM5A              ;BR TO ERROR IF V-BIT SET
012052  103002                          BCC     DNM5A              ;BR TO ERROR IF C-BIT CLEAR
012054  001401                          BEQ     DNM5A              ;BR TO ERROR IF Z-BIT SET
012056  100404                          BMI     DNM5B
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 762            <====
012060                          DNM5A:
012060  012742  000271                  MOV     #271,-(R2)         ;MOVE TO MAILBOX #  *******  271  *******
012064  005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
012066  000000                          HALT                       ;COND, CODES INCORRECT
012070  022700  000400          DNM5B:  CMP #400,R0                ;CHECK DEST. REGISTER
012074  001404                          BEQ     DNM5C
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 753            <====
012076  012742  000272                  MOV     #272,-(R2)         ;MOVE TO MAILBOX #  *******  272  *******
012102  005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
012104  000000                          HALT                       ;DEST. REGISTER NOT DECREMENTED BY 2
012106  022737  100000  000000  DNM5C:  CMP     #100000,@#0        ;CHECK DESTINATION DATA
012114  001404                          BEQ     TS142
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                   ;           CONDITIONAL BRANCH INST. AND    <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                   ;           WHICH FOLLOWS W/ 743            <====
012116  012742  000273                  MOV     #273,-(R2)         ;MOVE TO MAILBOX #  *******  273  *******
012122  005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
012124  000000                          HALT                       ;DEST. DATA INCORRECTLY MODIFIED
                                                                   ;  OR SEQUENCE ERROR

                                ;*****************************************************************************
                                ;TEST 142       TEST DEST. MODE 6 W/DOP NON-MODIFYING INST.
                                ;*****************************************************************************
012126  005212                  TS142:  INC     (R2)               ;UPDATE TEST NUMBER
012130  022712  000142                  CMP     #142,(R2)          ;SEQUENCE ERROR?
012134  001033                          BNE     TS143-10           ;BR TO ERROR HALT ON SEQ ERROR
012136  005000                          CLR     R0                 ;R0=0
012140  005010                          CLR     (R0)               ;LOC> 0=0
012142  052710  000001                  BIS     #1,(R0)            ;LOC. 0=1
012146  005100                          COM     R0                 ;R0=-1 C-BIT=1
012150  032760  000001  000001          BIT     #1,1(R0)           ;TRY DOPNM W/MODE 6
012156  001403                          BEQ     DNM6A              ;BR TO ERROR IF Z-BIT SET
012160  102402                          BVS     DNM6A              ;BR TO ERROR IF V-BIT SET
012162  103001                          BCC     DNM6A              ;BR TO ERROR IF C-BIT CLEAR
012164  100004                          BPL     DNM6B
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
```

```
                                                                   ;                    CONDITIONAL BRANCH INST. AND     <====
                                                                   ;                    REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;                    WHICH FOLLOWS W/ 763             <====
012166                                  DNM6A:
012166  012742  000274                          MOV     #274,-(R2)      ;MOVE TO MAILBOX #  *******  274  *******
012172  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012174  000000                                  HALT                    ;COND CODES INCORRECT
012176  022700  177777                  DNM6B:  CMP     #-1,R0          ;CHECK DEST. REGISTER
012202  001404                                  BEQ     DNM6C
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                   ;           CONDITIONAL BRANCH INST. AND      <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                   ;           WHICH FOLLOWS W/ 754              <====
012204  012742  000275                          MOV     #275,-(R2)      ;MOVE TO MAILBOX #  *******  275  *******
012210  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012212  000000                                  HALT                    ;DEST. REGISTER MODIFIED
012214  022737  000001  000000          DNM6C:  CMP     #1,@#0          ;CHECK DEST. DATA
012222  001404                                  BEQ     TS143
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                   ;           CONDITIONAL BRANCH INST. AND      <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                   ;           WHICH FOLLOWS W/ 744              <====
012224  012742  000276                          MOV     #276,-(R2)      ;MOVE TO MAILBOX #  *******  276  *******
012230  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012232  000000                                  HALT                    ;DEST. DATA MODIFIED
                                                                        ;  OR SEQUENCE ERROR

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

```
012314  012742  000300                  MOV     #300,-(R2)      ;MOVE TO MAILBOX #  *******  300  *******
012320  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012322  000000                          HALT                    ;DESTINATION REGISTER MODIFIED
012324  022737  125125  000000  DNM7C:  CMP     #125125,@#0     ;CHECK DEST. DATA
012332  001404                          BEQ     TS144

                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 743              <====
012334  012742  000301                  MOV     #301,-(R2)      ;MOVE TO MAILBOX #  *******  301  *******
012340  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012342  000000                          HALT                    ;DEST. DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR


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


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 2 INSTRUCTION.
```

```
                                ;       DATA IS SET IN RO USING SOP INSTRUCTIONS AND THEN MOVED
                                ;       TO LOCATION 0 USING MOV SRC MODE 0, DEST. MODE 1.
                                ;
                                ;*************************************************************************
                                ;TEST 145        TEST MOV DESTINATION MODE 2
                                ;*************************************************************************
012420  005212                  TS145:  INC     (R2)            ;UPDATE TEST NUMBER
012422  022712  000145                  CMP     #145,(R2)       ;SEQUENCE ERROR?
012426  001026                          BNE     TS146-10        ;BR TO ERROR HALT ON SEQ ERROR
012430  005000                          CLR     R0              ;R0=0
012432  005001                          CLR     R1              ;R1=0
012434  005010                          CLR     (R0)            ;LOC.0=0
012436  005110                          COM     (R0)            ;LOC. 0=-1
012440  010120                          MOV     R1,(R0)+        ;TRY MOVE MODE 0,2
012442  100402                          BMI     MDM2A           ;BR TO ERROR IF N SET
012444  102401                          BVS     MDM2A           ;BR TO ERROR IF V SET
012446  001404                          BEQ     MDM2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 767             <====
012450                          MDM2A:
012450  012742  000304                  MOV     #304,-(R2)      ;MOVE TO MAILBOX #  *******  304  *******
012454  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012456  000000                          HALT                    ;CC'S INCORRECT
012460  005300                  MDM2B:  DEC     R0
012462  005300                          DEC     R0
012464  001404                          BEQ     MDM2D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 760             <====
012466                          MDM2C:
012466  012742  000305                  MOV     #305,-(R2)      ;MOVE TO MAILBOX #  *******  305  *******
012472  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012474  000000                          HALT                    ;DESTINATION REGISTER NOT INCREMENTED PROPERLY
012476  005737  000000          MDM2D:  TST     @#0
012502  001404                          BEQ     TS146
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 751             <====
012504  012742  000306                  MOV     #306,-(R2)      ;MOVE TO MAILBOX #  *******  306  *******
012510  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012512  000000                          HALT                    ;DESTINATION DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*************************************************************************
                                ;
                                ;       THIS TEST VERIFIES DESTINATION MODE 2 W/MOVB INSTS. TWO DIFFERENT MOVB
                                ;INSTRUCTIONS ARE USED TO MOVE A TEST PATTERN FIRST TO BYTE 0 THEN TO BYTE 1.
                                ;
                                ;*************************************************************************
                                ;TEST 146        TEST MOV-BYTE DESTINATION MODE 2
                                ;*************************************************************************
012514  005212                  TS146:  INC     (R2)            ;UPDATE TEST NUMBER
```

```
012516  022712  000146                  CMP     #146,(R2)       ;SEQUENCE ERROR?
012522  001046                          BNE     TS147-10        ;BR TO ERROR HALT ON SEQ ERROR
012524  005000                          CLR     R0              ;R0=0
012526  005010                          CLR     (R0)            ;LOC. 0=0
012530  112720  000125                  MOVB    #125,(R0)+      ;TRY DESTINATION MODE 2 W/EVEN BYTE
012534  102402                          BVS     MBDM2A          ;BR TO ERROR IF V SET
012536  001401                          BEQ     MBDM2A          ;BR TO ERROR IF Z SET
012540  100004                          BPL     MBDM2B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 770           <====
012542                          MBDM2A:
012542  012742  000307                  MOV     #307,-(R2)      ;MOVE TO MAILBOX #  *******  307  *******
012546  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012550  000000                          HALT                    ;CC'S INCORRECT
012552  022700  000001          MBDM2B: CMP     #1,R0
012556  001404                          BEQ     MBDM2C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
012560  012742  000310                  MOV     #310,-(R2)      ;MOVE TO MAILBOX #  *******  310  *******
012564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012566  000000                          HALT                    ;REGISTER NOT INCREMENTED BY ONE
012570  112720  000252          MBDM2C: MOVB    #252,(R0)+      ;TRY DESTINATION MODE 2 W/ODD BYTE
012574  102402                          BVS     MBDM2D
012576  001401                          BEQ     MBDM2D
012600  100404                          BMI     MBDM2E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 750           <====
012602                          MBDM2D:
012602  012742  000311                  MOV     #311,-(R2)      ;MOVE TO MAILBOX #  *******  311  *******
012606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012610  000000                          HALT                    ;CC'S NOT SET CORRECT
012612  022700  000002          MBDM2E: CMP     #2,R0
012616  001404                          BEQ     MBDM2F
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 741           <====
012620  012742  000312                  MOV     #312,-(R2)      ;MOVE TO MAILBOX #  *******  312  *******
012624  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012626  000000                          HALT                    ;REGISTER NOT INCREMENTED BY ONE
012630  022737  125125  000000  MBDM2F: CMP     #125125,@#0     ;CHECK DATA
012636  001404                          BEQ     TS147
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 731           <====
012640  012742  000313                  MOV     #313,-(R2)      ;MOVE TO MAILBOX #  *******  313  *******
012644  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
012646  000000                          HALT                    ;DESTINATION DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR
```

```

                                        ;*****************************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MOV DESTINATION MODE 3. R0 IS USED TO PICK UP
                                        ;AN ADDRESS AT LOC. 400. LOC 400 POINTS TO LOC. 0 THE EFFECTIVE DEST. ADDR.. ALSO, MOVB
                                        ;INST. ARE USED W/ EVEN AND ODD BYTES TO CHECK MOV BYTES INST AND MODE 37 DESTINATIONS.
                                        ;*****************************************************************************************
                                        ;TEST 147       TEST MOV(B) DESTINATION MODE 3
                                        ;*****************************************************************************************
012650  005212                          TS147:  INC     (R2)                    ;UPDATE TEST NUMBER
012652  022712  000147                          CMP     #147,(R2)               ;SEQUENCE ERROR?
012656  001057                                  BNE     TS150-10                ;BR TO ERROR HALT ON SEQ ERROR
012660  012700  000400                          MOV     #400,R0                 ;R0=400
012664  005010                                  CLR     (R0)                    ;LOC. 400 POINTS TO LOC. 0
012666  005037  000000                          CLR     @#0                     ;LOC. 0=0
012672  012730  125252                          MOV     #125252,@(R0)+          ;TRY MOV DESTINATION MODE 2
012676  102402                                  BVS     MDM3A                   ;BR TO ERROR IF V SET
012700  001401                                  BEQ     MDM3A                   ;BR TO ERROR IF Z SET
012702  100404                                  BMI     MDM3B
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 765             <====
012704                                  MDM3A:
012704  012742  000314                          MOV     #314,-(R2)              ;MOVE TO MAILBOX #  *******  314  *******
012710  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
012712  000000                                  HALT                            ;CC'S INCORRECT
012714  022700  000402                  MDM3B:  CMP     #402,R0                 ;CHECK DEST. MODE REGISTER
012720  001404                                  BEQ     MDM3C
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 756             <====
012722  012742  000315                          MOV     #315,-(R2)              ;MOVE TO MAILBOX #  *******  315  *******
012726  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
012730  000000                                  HALT                            ;REGISTER NOT INCREMENTED BY 2
012732  022737  125252  000000          MDM3C:  CMP     #125252,@#0             ;CHECK DESTINATION DATA
012740  001404                                  BEQ     MDM3D
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 746             <====
012742  012742  000316                          MOV     #316,-(R2)              ;MOVE TO MAILBOX #  *******  316  *******
012746  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
012750  000000                                  HALT                            ;DESTINATION DATA INCORRECT
012752  112737  000125  000000          MDM3D:  MOVB    #125,@#0                ;TRY MOVB DESTINATION MODE Z EVEN BYTE
012760  022737  125125  000000                  CMP     #125125,@#0             ;CHECK DATA
012766  001404                                  BEQ     MDM3E
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 733             <====
012770  012742  000317                          MOV     #317,-(R2)              ;MOVE TO MAILBOX #  *******  317  *******
012774  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
012776  000000                                  HALT                            ;DESTINATION DATA INCORRECT
013000  112737  000525  000001          MDM3E:  MOVB    #525,@#1                ;TRY MOVB DESTINATION MODE 2 ODD BYTE
```

```
013006  022737  052525  000000           CMP     #52525,@#0           ;CHECK DATA
013014  001404                           BEQ     TS150
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                      ;           WHICH FOLLOWS W/ 720            <====
013016  012742  000320                   MOV     #320,-(R2)           ;MOVE TO MAILBOX #  *******  320  *******
013022  005242                           INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
013024  000000                           HALT                         ;

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

```
                                                        ; OR SEQUENCE ERROR

                        ;*************************************************************************
                        ;
                        ;       THIS TEST VERIFIES THE MOVB DESTINATION MODE 4 INSTRUCTION
                        ;       ON BOTH ODD AND EVEN BYTES. SOP INSTRUCTIONS ON R4 ARE
                        ;       USED TO CLEAR TARGET LOCATION 0. R0 IS USED AS THE MODE 4
                        ;       ADDRESSING REGISTER, AND CMP AND CONDITIONAL BRANCH
                        ;       INSTRUCTIONS ARE USED TO VERIFY THE DATA.
                        ;
                        ;*************************************************************************
                        ;TEST 151       TEST MOVB DESTINATION MODE 4
                        ;*************************************************************************
013122  005212          TS151:  INC     (R2)            ;UPDATE TEST NUMBER
013124  022712  000151          CMP     #151,(R2)       ;SEQUENCE ERROR?
013130  001046                  BNE     TS152-10        ;BR TO ERROR HALT ON SEQ ERROR
013132  005004                  CLR     R4              ;R4=0
013134  005014                  CLR     (R4)            ;LOC. 0=0
013136  012700  000002          MOV     #2,R0           ;R0 = 2
013142  112740  125125          MOVB    #125125,-(R0)   ;TRY MOVB DEST. MODE 4-ODD BYTE
013146  020027  000001          CMP     R0,#1           ;CHECK THAT DEST. REG. WAS DECREMENTED
013152  001404                  BEQ     MBDM4A
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 766             <====
013154  012742  000324          MOV     #324,-(R2)      ;MOVE TO MAILBOX #  *******  324  *******
013160  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013162  000000                  HALT                    ;DESTINATION REG. NOT DECREMENTED BY 1
013164  021427  052400  MBDM4A: CMP     (R4),#52400     ;CHECK DEST. DATA
013170  001404                  BEQ     MBDM4B
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 757             <====
013172  012742  000325          MOV     #325,-(R2)      ;MOVE TO MAILBOX #  *******  325  *******
013176  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013200  000000                  HALT                    ;DEST. DATA NOT CORRECT
013202  112740  125125  MBDM4B: MOVB    #125125,-(R0)   ;TRY MOVB DEST. MODE 4--EVEN BYTE
013206  102402                  BVS     MBDM4C          ;BR. TO ERROR IF V-BIT SET
013210  001401                  BEQ     MBDM4C          ;BR TO ERROR IF Z-BIT SET
013212  100004                  BPL     MBDM4D
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 746             <====
013214                  MBDM4C:
013214  012742  000326          MOV     #326,-(R2)      ;MOVE TO MAILBOX #  *******  326  *******
013220  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013222  000000                  HALT                    ;COND. CODES INCORRECT
013224  005700          MBDM4D: TST     R0              ;CHECK MODE 4 DEST. REGISTER
013226  001404                  BEQ     MBDM4E
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 740             <====
```

```
013230 012742 000327            MOV     #327,-(R2)      ;MOVE TO MAILBOX #  *******  327  *******
013234 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013236 000000                   HALT                    ;DESTINATION REG NOT DECREMENTED BY 1
013240 021427 052525    MBDM4E: CMP     (R4),#52525     ;CHECK DEST. DAT^A
013244 001404                   BEQ     TS152
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 731             <====
013246 012742 000330            MOV     #330,-(R2)      ;MOVE TO MAILBOX #  *******  330  *******
013252 005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013254 000000                   HALT                    ;DESTINATION DATA INCORRECT
                                                        ;  OR SEQUENCE ERROR

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

```
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 750             <====
013344  012742  000333          MOV     #333,-(R2)      ;MOVE TO MAILBOX #  *******  333  *******
013350  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013352  000000                  HALT                    ;DEST. DATA INCORRECT
013354  012700  000406  MDM5D:  MOV     #406,R0         ;R0=406
013360  112750  000377          MOVB    #377,@-(R0)     ;TRY MOV DEST. MODE 5 --EVEN BYTE
013364  022700  000404          CMP     #404,R0         ;CHECK MODE 5 REG.
013370  001404                  BEQ     MDM5E
                                                        ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 735             <====
013372  012742  000334          MOV     #334,-(R2)      ;MOVE TO MAILBOX #  *******  334  *******
013376  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013400  000000                  HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
013402  022714  177721  MDM5E:  CMP     #177721,(R4)    ;CHECK DEST. DATA
013406  001404                  BEQ     TS153
                                                        ; TO SCOPE:     CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;               CONDITIONAL BRANCH INST. AND     <====
                                                        ;               REPLACE THE MOVE INSTRUCTION     <====
                                                        ;               WHICH FOLLOWS W/ 726             <====
013410  012742  000335          MOV     #335,-(R2)      ;MOVE TO MAILBOX #  *******  335  *******
013414  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013416  000000                  HALT                    ;DEST. DATA INCORRECT
                                                        ;  OR SEQUENCE ERROR


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

```
013460  000000                          HALT                    ;COND. CODES INCORRECT
013462  022700  000001          MDM6B:  CMP     #1,R0           ;CHECK DEST. REGISTER UNALTERED
013466  001404                          BEQ     MDM6C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 757              <====
013470  012742  000337                  MOV     #337,-(R2)      ;MOVE TO MAILBOX #  *******  337  *******
013474  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013476  000000                          HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013500  022737  052525  000000  MDM6C:  CMP     #52525,@#0      ;CHECK DEST. DATA
013506  001404                          BEQ     MDM6D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 747              <====
013510  012742  000340                  MOV     #340,-(R2)      ;MOVE TO MAILBOX #  *******  340  *******
013514  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013516  000000                          HALT                    ;DEST. DATA INCORRECT
013520  012700  000002          MDM6D:  MOV     #2,R0           ;R0=2
013524  112760  000377  177777          MOVB    #377,-1(R0)     ;TRY MOVB DEST. MODE 6
013532  022700  000002                  CMP     #2,R0           ;CHECK DEST. REGISTER UNALTERED
013536  001404                          BEQ     MDM6E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 733              <====
013540  012742  000341                  MOV     #341,-(R2)      ;MOVE TO MAILBOX #  *******  341  *******
013544  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013546  000000                          HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013550  022737  177525  000000  MDM6E:  CMP     #177525,@#0     ;CHECK DEST. DATA
013556  001404                          BEQ     TS154
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 723              <====
013560  012742  000342                  MOV     #342,-(R2)      ;MOVE TO MAILBOX #  *******  342  *******
013564  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013566  000000                          HALT                    ;DEST. DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR


                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE MOV DESTINATION MODE 7 AND MOVB - ODD BYTE
                                ;DESTINATION MODE 7 INSTRUCTIONS. R4 POINTS TO TARGET LOC.0 AND R0
                                ;IS USED AS THE MODE 7 ADDRESSING REGISTER. CMP INSTRUCTIONS ARE
                                ;USED TO VERIFY PROPER ADDRESSING AND DATA.
                                ;
                                ;*******************************************************************************
                                ;TEST 154       TEST MOV DESTINATION MODE 7
                                ;*******************************************************************************
013570  005212                  TS154:  INC     (R2)            ;UPDATE TEST NUMBER
013572  022712  000154                  CMP     #154,(R2)       ;SEQUENCE ERROR?
013576  001053                          BNE     TS155-10        ;BR TO ERROR HALT ON SEQ ERROR
013600  005004                          CLR     R4              ;R4=0
013602  005014                          CLR     (R4)            ;LOC.0=0
```

```
013604  012700  000403                  MOV     #403,R0         ;R0=403
013610  012770  070707  177777          MOV     #70707,@-1(R0)  ;TRY MOV W/DEST MODE 7
013616  102402                          BVS     MDM7A           ;BR. TO ERROR IF V-BIT SET
013620  001401                          BEQ     MDM7A           ;BR TO ERROR IF Z-BIT SET
013622  100004                          BPL     MDM7B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 765             <====
013624                                  MDM7A:
013624  012742  000343                  MOV     #343,-(R2)      ;MOVE TO MAILBOX #  *******  343  *******
013630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013632  000000                          HALT                    ;COND. CODES INCORRECT
013634  022700  000403          MDM7B:  CMP     #403,R0         ;CHECK DEST. REGISTER
013640  001404                          BEQ     MDM7C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 756             <====
013642  012742  000344                  MOV     #344,-(R2)      ;MOVE TO MAILBOX #  *******  344  *******
013646  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013650  000000                          HALT                    ;DEST. REGISTER INCORRECTLY ALTERED
013652  022737  070707  000000  MDM7C:  CMP     #70707,@#0      ;CHECK DEST. DATA
013660  001404                          BEQ     MDM7D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 746             <====
013662  012742  000345                  MOV     #345,-(R2)      ;MOVE TO MAILBOX #  *******  345  *******
013666  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013670  000000                          HALT                    ;DEST. DATA INCORRECT
013672  112770  107070  000001  MDM7D:  MOVB    #107070,@1(R0)  ;TRY MOVB W/DEST MODE 7--ODD BYTE
013700  022700  000403                  CMP     #403,R0         ;CHECK MODE 7 DEST. REG.
013704  001404                          BEQ     MDM7E
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 734             <====
013706  012742  000346                  MOV     #346,-(R2)      ;MOVE TO MAILBOX #  *******  346  *******
013712  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013714  000000                          HALT                    ;DEST. DATA INCORRECT
013716  022737  034307  000000  MDM7E:  CMP     #34307,@#0      ;CHECK DEST. DATA
013724  001404                          BEQ     TS155
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 724             <====
013726  012742  000347                  MOV     #347,-(R2)      ;MOVE TO MAILBOX #  *******  347  *******
013732  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
013734  000000                          HALT                    ;DESTINATION DATA INCORRECT
                                                                ;  OR SEQUENCE ERROR

                                ;*************************************************************************************
                                ;
                                ;
                                ;       THIS TEST VERIFIES MODE 4 DOUBLE OPERAND INSTRUCTIONS.
                                ;THE TEST USES MODE 4 ADDRESSING WITH REGISTER 0 TO MOVE THRU A
```

```
                                          ;TABLE OF OPERANDS.  THE TABLE OF OPERANDS AND THE WORK LOCATION IS
                                          ;STORED FOLLOWING THE TEST CODE.  A SERIES OF 5 DOP INSTRUCTIONS UTILIZES
                                          ;THE DATA IN THE TABLE TO CYCLE THE WORK LOCATION THRU A SET OF
                                          ;VALUE.  THE DATA HAS BEEN CHOSEN TO INSURE THAT NO SINGLE ERROR WILL
                                          ;GO UNDETECTED.  WORD AND BYTE INSTRUCTION ACCESSING BOTH EVEN AND
                                          ;ODD ADDRESSES ARE USED IN THE TEST.  THE LISTING SHOWS THE
                                          ;EXPECTED INTERMEDIATE RESULT AS EACH INSTRUCTION IS EXECUTED.
                                          ;
                                          ;*******************************************************************************
                                          ;TEST 155        TEST MODE 4 W/ DOP INSTS.
                                          ;*******************************************************************************
013736  005212                            TS155:  INC     (R2)                    ;UPDATE TEST NUMBER
013740  022712  000155                            CMP     #155,(R2)               ;SEQUENCE ERROR?
013744  001015                                    BNE     DOP4                    ;BR TO ERROR HALT ON SEQ ERROR
013746  012700  014020                            MOV     #TBL1,R0                ;INITIALIZE R0
013752  014037  014020                            MOV     -(R0),@#TBL1            ;TBL1=125252
013756  064037  014020                            ADD     -(R0),@#TBL1            ;TBL1=000377
013762  144037  014020                            BICB    -(R0),@#TBL1            ;TBL1=000252
013766  154037  014021                            BISB    -(R0),@#TBL1+1          ;TBL1=125252
013772  024037  014020                            CMP     -(R0),@#TBL1            ;CHECK RESULT
013776  001411                                    BEQ     TS156
                                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                  ;           WHICH FOLLOWS W/ 762             <====
014000                                    DOP4:
014000  012742  000350                            MOV     #350,-(R2)              ;MOVE TO MAILBOX #  *******  350  *******
014004  005242                                    INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
014006  000000                                    HALT                            ;RESULT OF MODE 4 INSTS. INCORRECT
                                                                                  ;  OR SEQUENCE ERROR

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

                                          ;*******************************************************************************
                                          ;
                                          ;       THIS TEST VERIFIES MODE 5 DOUBLE OPERAND INSTRUCTIONS.
                                          ;THE TEST USES AN ADDRESS TABLE STORED FOLLOWING THE TEST CODE.
                                          ;THIS TABLE IS SIMPLY A TABLE OF ADDRESS POINTERS WHICH ADDRESS
                                          ;THE DATA TABLE USED IN THE PREVIOUS TEST.  THE TEST IS IDENTICAL TO
                                          ;THE PREVIOUS TEST EXCEPT THE DATA IS REFERENCED USING THIS ADDRESS
                                          ;TABLE AND MODE 5 ADDRESSING.  (SEE PREVIOUS TEST).
                                          ;
                                          ;*******************************************************************************
                                          ;TEST 156        TEST MODE 5 W/ DOP INSTS.
                                          ;*******************************************************************************
014022  005212                            TS156:  INC     (R2)                    ;UPDATE TEST NUMBER
014024  022712  000156                            CMP     #156,(R2)               ;SEQUENCE ERROR?
014030  001015                                    BNE     DOP5                    ;BR TO ERROR HALT ON SEQ ERROR
014032  012700  014106                            MOV     #TBL2+2,R0              ;INITIALIZE R0
014036  015037  014020                            MOV     @-(R0),@#TBL1           ;TBL1=125252
014042  065037  014020                            ADD     @-(R0),@#TBL1           ;TBL1=000377
014046  145037  014020                            BICB    @-(R0),@#TBL1           ;TBL1=000252
```

```
014052  155037  014021                  BISB    @-(R0),@#TBL1+1 ;TBL1=125252
014056  025037  014020                  CMP     @-(R0),@#TBL1   ;CHECK RESULT
014062  001411                          BEQ     TS157
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 762             <====
014064                          DOP5:
014064  012742  000351                  MOV     #351,-(R2)      ;MOVE TO MAILBOX #  *******  351  *******
014070  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014072  000000                          HALT                    ;RESULT OF MODE 5 INSTS. INCORRECT
                                                                ;  OR SEQUENCE ERROR
014074  014010                          TBL1-10
014076  014012                          TBL1-6
014100  014013                          TBL1-5
014102  014014                          TBL1-4
014104  014016                  TBL2:   TBL1-2

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

```
                                        ;IN THE MODE 7 INSTRUCTIONS.  THE DATA RESULTS ARE IDENTICAL TO
                                        ;THOSE EXPECTED IN THE MODE 5 TESTS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 160        TEST MODE 7 W/ DOP INSTS.
                                        ;*******************************************************************************
014172  005212                          TS160:  INC     (R2)                    ;UPDATE TEST NUMBER
014174  022712  000160                          CMP     #160,(R2)               ;SEQUENCE ERROR?
014200  001022                                  BNE     TS161-10                ;BR TO ERROR HALT ON SEQ ERROR
014202  012700  014100                          MOV     #TBL2-4,R0              ;INITIALIZE R0
014206  017037  000004  014020                  MOV     @4(R0),@#TBL1           ;TBL1=125252
014214  067037  000002  014020                  ADD     @2(R0),@#TBL1           ;TBL1=000377
014222  147037  000000  014020                  BICB    @0(R0),@#TBL1           ;TBL1=000252
014230  157037  177776  014021                  BISB    @-2(R0),@#TBL1+1                ;TBL1=125252
014236  027037  177774  014020                  CMP     @-4(R0),@#TBL1          ;CHECK RESULT
014244  001404                                  BEQ     TS161
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 755             <====
014246  012742  000353                          MOV     #353,-(R2)      ;MOVE TO MAILBOX #  *******  353  *******
014252  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014254  000000                                  HALT                    ;RESULT OF MODE 7 INSTS INCORRECT
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE ROTATE MODE 0 INSTRUCTIONS.
                                        ;R0 IS LOADED WITH A DATA PATTERN, THE C-BIT IS LOADED, AND
                                        ;AN ROL INSTRUCTION IS EXECUTED WITH MODE 0.  THE OPERATION IS CHECKED
                                        ;BY TESTING THE RESULTING DATA AND THE STATE OF THE C AND V BITS.
                                        ;NEXT, THE SAME PROCEDURE IS EXECUTED TO TEST MODE 0 BYTE INSTRUCTIONS.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 161        TEST ROTATE INSTRUCTIONS OF MODE 0
                                        ;*******************************************************************************
014256  005212                          TS161:  INC     (R2)                    ;UPDATE TEST NUMBER
014260  022712  000161                          CMP     #161,(R2)               ;SEQUENCE ERROR?
014264  001026                                  BNE     TS162-10                ;BR TO ERROR HALT ON SEQ ERROR
014266  012700  125252                          MOV     #125252,R0              ;INITIALIZE DATA
014272  000261                                  SEC                             ;SET C-BIT
014274  006100                                  ROL     R0                      ;TRY ROL W/ MODE 0
014276  102004                                  BVC     ROT0A                   ;CC=0011
014300  103003                                  BCC     ROT0A
014302  022700  052525                          CMP     #052525,R0              ;CHECK DATA
014306  001404                                  BEQ     ROT0B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 766             <====
014310                                  ROT0A:
014310  012742  000354                          MOV     #354,-(R2)      ;MOVE TO MAILBOX #  *******  354  *******
014314  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014316  000000                                  HALT                    ;ROL MODE 0 FAILED
014320  012700  125252                  ROT0B:  MOV     #125252,R0      ;INITIALIZE DATA
014324  000261                                  SEC                     ;SET C-BIT
014326  106100                                  ROLB    R0              ;TRY ROL W/ MODE 0 EVEN BYTE
```

```
014330  102004                          BVC     ROTOC           ;CC=0011
014332  103003                          BCC     ROTOC
014334  022700  125125                  CMP     #125125,R0      ;CHECK DATA
014340  001404                          BEQ     TS162
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 751             <====
014342                          ROTOC:
014342  012742  000355                  MOV     #355,-(R2)      ;MOVE TO MAILBOX #  *******  355  *******
014346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014350  000000                          HALT                    ;ROLB MODE 0 FAILED
                                                                ;  OR SEQUENCE ERROR



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

```
                                                                        ;               WHICH FOLLOWS W/ 746          <====
014444                                  ROT1C:
014444  012742  000357                          MOV     #357,-(R2)      ;MOVE TO MAILBOX #  *******  357  *******
014450  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014452  000000                                  HALT                    ;ROLB W/ MODE 1 EVEN BYTE FAILED
014454  012710  125252                  ROT1D:  MOV     #125252,(R0)
014460  005000                                  CLR     R0              ;POINT TO ODD BYTE
014462  005200                                  INC     R0
014464  000261                                  SEC                     ;SET C-BIT
014466  106110                                  ROLB    (R0)            ;TRY ROLB W/ MODE 1 ODD BYTE
014470  102005                                  BVC     ROT1E           ;CC=0011
014472  103004                                  BCC     ROT1E
014474  022737  052652  000000                  CMP     #052652,@#0     ;CHECK DATA
014502  001404                                  BEQ     TS163
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 726              <====
014504                                  ROT1E:
014504  012742  000360                          MOV     #360,-(R2)      ;MOVE TO MAILBOX #  *******  360  *******
014510  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014512  000000                                  HALT                    ;ROLB W/ MODE 1 ODD BYTE FAILED
                                                                        ;  OR SEQUENCE ERROR

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

```
014570  012710  004040                    MOV     #4040,(R0)      ;INITIALIZE DATA
014574  000241                            CLC                     ;CLEAR C-BIT
014576  106120                            ROLB    (R0)+           ;TRY ROLB W/ MODE 2 EVEN BYTE
014600  103406                            BCS     ROT2C           ;CHECK C-BIT
014602  022737  004100  000000            CMP     #4100,@#0       ;CHECK DATA
014610  001002                            BNE     ROT2C           ;BRANCH IF DATA INCORRECT
014612  005300                            DEC     R0              ;CHECK R0
014614  001404                            BEQ     ROT2D
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 742            <====
014616                            ROT2C:
014616  012742  000362                    MOV     #362,-(R2)      ;MOVE TO MAILBOX #  *******  362  *******
014622  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014624  000000                            HALT                    ;ROLB W/ MODE 2 EVEN BYTE FAILED
014626  005000                    ROT2D:  CLR     R0              ;POINT TO LOC 0
014630  012710  004040                    MOV     #4040,(R0)      ;INITIALIZE DATA
014634  005200                            INC     R0              ;POINT TO ODD BYTE OF DATA
014636  000261                            SEC                     ;SET C-BIT
014640  106120                            ROLB    (R0)+           ;TRY ROL W/ MODE 2 ODD BYTE
014642  103407                            BCS     ROT2E           ;CHECK C-BIT
014644  022737  010440  000000            CMP     #10440,@#0      ;CHECK DATA
014652  001003                            BNE     ROT2E           ;BRANCH IF DATA INCORRECT
014654  005300                            DEC     R0              ;CHECK R0
014656  005300                            DEC     R0
014660  001404                            BEQ     TS164
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 720            <====
014662                            ROT2E:
014662  012742  000363                    MOV     #363,-(R2)      ;MOVE TO MAILBOX #  *******  363  *******
014666  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014670  000000                            HALT                    ;ROLB W/ MODE 2 ODD BYTE FAILED
                                                                  ;  OR SEQUENCE ERROR



                                  ;*******************************************************************************
                                  ;
                                  ;       THIS TEST VERIFIES MODE 3 ROTATE INSTRUCTIONS.
                                  ;THIS TEST USES THE SAME PROCEDURES AS IN THE OTHER ROTATE
                                  ;TESTS.  THE DATA IS STORED IN LOC. 0 AND IS ADDRESSED USING
                                  ;MODE 37.  BYTE ADDRESSING IS ALSO CHECKED FOR EVEN AND ODD BYTES.
                                  ;
                                  ;*******************************************************************************
                                  ;TEST 164       TEST ROTATE INSTRUCTIONS /W MODE 3
                                  ;*******************************************************************************
014672  005212                    TS164:  INC     (R2)            ;UPDATE TEST NUMBER
014674  022712  000164                    CMP     #164,(R2)       ;SEQUENCE ERROR?
014700  001051                            BNE     TS165-10        ;BR TO ERROR HALT ON SEQ ERROR
014702  012737  052525  000000            MOV     #52525,@#0      ;INITIALIZE DATA IN LOC 0
014710  000261                            SEC                     ;SET C-BIT
014712  006137  000000                    ROL     @#0             ;TRO ROL W/ MODE 3
014716  103404                            BCS     ROT3A           ;CHECK C-BIT
014720  022737  125253  000000            CMP     #125253,@#0     ;CHECK DATA
```

```
014726  001404                          BEQ     ROT3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 764            <====
014730                          ROT3A:
014730  012742  000364                  MOV     #364,-(R2)      ;MOVE TO MAILBOX #  *******  364  *******
014734  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014736  000000                          HALT                    ;ROL W/ MODE 3 FAILED
014740  012737  125252  000000  ROT3B:  MOV     #125252,@#0     ;INITIALIZE DATA
014746  000241                          CLC                     ;CLEAR C-BIT
014750  106137  000000                  ROLB    @#0             ;TRY ROL W/ MODE 3 EVEN BYTE
014754  103004                          BCC     ROT3C           ;CHECK C-BIT
014756  023727  000000  125124  4$:     CMP     @#0,#125124     ;CHECK DATA
014764  001404                          BEQ     ROT3D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 745            <====
014766                          ROT3C:
014766  012742  000365                  MOV     #365,-(R2)      ;MOVE TO MAILBOX #  *******  365  *******
014772  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
014774  000000                          HALT                    ;ROL W/ MODE 3 EVEN BYTE FAILED
014776  012737  125252  000000  ROT3D:  MOV     #125252,@#0     ;INITIALIZE DATA IN LOC. 0
015004  000261                          SEC                     ;SET C-BIT
015006  106137  000001                  ROLB    @#1             ;TRY ROL W/ MODE 3 ODD BYTE
015012  103004                          BCC     ROT3E           ;CHECK C-BIT
015014  022737  052652  000000          CMP     #052652,@#0     ;CHECK DATA
015022  001404                          BEQ     TS165
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 726            <====
015024                          ROT3E:
015024  012742  000366                  MOV     #366,-(R2)      ;MOVE TO MAILBOX #  *******  366  *******
015030  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015032  000000                          HALT                    ;ROL W/ MODE 3 ODD BYTE FAILED
                                                                ;  OR SEQUENCE ERROR

                                ;*****************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 4 ROTATE INSTRUCTIONS.  THE DATA IS
                                ;STORED IN LOC. 0.  R0 IS SET TO 2 AND THE CARRY IS SET.  AN ROL MODE 4
                                ;IS USED TO ROTATE LOCATION 0 USING R0.  THE DATA IS CHECKED
                                ;AND THE C AND V BITS ARE TESTED.  THE PROPER DECREMENTING OF
                                ;R0 IS VERIFIED.
                                ;
                                ;*****************************************************************************
                                ;TEST 165       TEST MODE 4 W/ ROTATE INSTRUCTIONS
                                ;*****************************************************************************
015034  005212                  TS165:  INC     (R2)            ;UPDATE TEST NUMBER
015036  022712  000165                  CMP     #165,(R2)       ;SEQUENCE ERROR?
015042  001016                          BNE     TS166-10        ;BR TO ERROR HALT ON SEQ ERROR
015044  012737  070707  000000          MOV     #070707,@#0     ;INITIALIZE DATA IN LOC. 0
015052  012700  000002                  MOV     #2,R0           ;INITIALIZE R0 AS POINTER
015056  000261                          SEC                     ;SET C-BIT
```

```
015060  006140                          ROL     -(R0)           ;TRY ROL W/ MODE 4
015062  103406                          BCS     ROT4            ;CHECK C-BIT
015064  022737  161617  000000          CMP     #161617,@#0     ;CHECK DATA
015072  001002                          BNE     ROT4            ;BRANCH IF DATA INCORRECT
015074  005700                          TST     R0              ;CHECK MODE 4 REGISTER
015076  001404                          BEQ     TS166

                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 761            <====
015100                          ROT4:
015100  012742  000367                  MOV     #367,-(R2)      ;MOVE TO MAILBOX #  *******  367  *******
015104  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015106  000000                          HALT                    ;ROL MODE 4 FAILED
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 5 ROTATE INSTRUCTIONS.
                                ;THE DATA IS STORED IN A WORK LOCATION (ROTX) AT THE END OF THE
                                ;TEST CODE.  LOC. 0 IS LOADED WITH THE ADDRESS OF THE DATA (ROTX).
                                ;R0 IS SET TO 2.  THE CARRY IS CLEARED AND A MODE 5 ROL
                                ;IS EXECUTED USING R0 AS AN ADDRESSING REGISTER.  THE DATA IS
                                ;CHECKED, THE C AND V BITS TESTED, AND R0 CHECKED FOR PROPER
                                ;DECREMENTING.
                                ;
                                ;*******************************************************************************
                                ;TEST 166       TEST MODE 5 W/ ROTATE INSTRUCTIONS
                                ;*******************************************************************************
015110  005212                  TS166:  INC     (R2)            ;UPDATE TEST NUMBER
015112  022712  000166                  CMP     #166,(R2)       ;SEQUENCE ERROR?
015116  001021                          BNE     ROT5            ;BR TO ERROR HALT ON SEQ ERROR
015120  012737  015172  000000          MOV     #ROTX,@#0       ;MOVE POINTER TO LOC. 0
015126  012700  000002                  MOV     #2,R0           ;SET MODE 5 REG. TO LOC. 0
015132  012767  107070  000032          MOV     #107070,ROTX    ;INITIALIZE DATA
015140  000241                          CLC                     ;CLEAR C-BIT
015142  006150                          ROL     @-(R0)          ;TRY ROL W/ MODE 5
015144  103006                          BCC     ROT5            ;CHECK C-BIT
015146  022737  016160  015172          CMP     #016160,@#ROTX  ;CHECK DATA
015154  001002                          BNE     ROT5            ;BRANCH IF DATA INCORRECT
015156  005700                          TST     R0              ;CHECK MODE 5 REGISTER
015160  001405                          BEQ     TS167

                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 756            <====
015162                          ROT5:
015162  012742  000370                  MOV     #370,-(R2)      ;MOVE TO MAILBOX #  *******  370  *******
015166  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015170  000000                          HALT                    ;ROL MODE 5 FAILED
                                                                ;  OR SEQUENCE ERROR
015172  000000                  ROTX:   0

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 6 ROTATE INSTRUCTIONS.
```

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



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

```
015316  000000                            ROTXAD: 0


                                          ;*************************************************************************
                                          ;
                                          ;       THIS TEST VERIFIES MODE 0 SWAB INSTRUCTION.  R0 IS SET TO
                                          ;177400.  A SWAB MODE 0 IS EXECUTED AND THE CONDITIONAL BRANCH
                                          ;IS USED TO CHECK THE SIGN OF THE RESULT.  ALSO, A COMPARISON
                                          ;IS MADE TO CHECK THE DATA RESULTS.
                                          ;
                                          ;*************************************************************************
                                          ;TEST 171        TEST MODE 0 W/ SWAB INST.
                                          ;*************************************************************************
015320  005212                            TS171:  INC     (R2)            ;UPDATE TEST NUMBER
015322  022712  000171                            CMP     #171,(R2)       ;SEQUENCE ERROR?
015326  001013                                    BNE     TS172-10        ;BR TO ERROR HALT ON SEQ ERROR
015330  012700  177400                            MOV     #177400,R0      ;MOVE TEST PATTERN TO R0
015334  000300                                    SWAB    R0              ;TRY SWAB MODE 0
015336  100404                                    BMI     SB0
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 773            <====
015340  012742  000373                            MOV     #373,-(R2)      ;MOVE TO MAILBOX #  *******  373  *******
015344  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015346  000000                                    HALT                    ;SWAB DID NOT SET CC'S CORRECT
015350  022700  000377                    SB0:    CMP     #377,R0         ;CHECK RESULT
015354  001404                                    BEQ     TS172
                                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                          ;           CONDITIONAL BRANCH INST. AND    <====
                                                                          ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                          ;           WHICH FOLLOWS W/ 764            <====
015356  012742  000374                            MOV     #374,-(R2)      ;MOVE TO MAILBOX #  *******  374  *******
015362  005242                                    INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015364  000000                                    HALT                    ;RESULT OF SWAB MODE 0 FAILED
                                                                          ;  OR SEQUENCE ERROR


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

```
                                                                ;               CONDITIONAL BRANCH INST. AND    <====
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 766            <====
015420  012742  000375                  MOV     #375,-(R2)      ;MOVE TO MAILBOX # ******* 375 *******
015424  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015426  000000                          HALT                    ;RESULT OF SWAB MODE 1 FAILED
                                                                ;  OR SEQUENCE ERROR

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

                                ;*******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES MODE 3 SWAB INSTRUCTION.  THE TEST
                                ;PATTERN IS MOVED TO LOC 0.  A MODE 3 SWAB INSTRUCTION IS EXECUTED
                                ;USING R7 AS THE ADDRESSING REGISTER.  A COMPARE VERIFIES THE
                                ;DATA RESULTS.
                                ;
                                ;*******************************************************************************
                                ;TEST 174       TEST MODE 3 W/SWAB INST.
```

```
                                        ;*******************************************************************************
015510  005212                          TS174:  INC     (R2)            ;UPDATE TEST NUMBER
015512  022712  000174                          CMP     #174,(R2)       ;SEQUENCE ERROR?
015516  001011                                  BNE     TS175-10        ;BR TO ERROR HALT ON SEQ ERROR
015520  012737  000377  000000                  MOV     #377,@#0        ;MOVE TEST PATTERN TO LOC. 0
015526  000337  000000                          SWAB    @#0             ;TRY SWAB W/ MODE 3
015532  022737  177400  000000                  CMP     #177400,@#0     ;CHECK RESULT
015540  001404                                  BEQ     TS175
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 766             <====
015542  012742  000400                          MOV     #400,-(R2)      ;MOVE TO MAILBOX #  *******  400  *******
015546  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
015550  000000                                  HALT                    ;RESULT OF SWAB INCORRECT
                                                                        ;  OR SEQUENCE ERROR




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

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



                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES MODE 6 SWAB INSTRUCTION.  THIS TEST
                                        ;USES A WORK LOCATION (SB6X) FOLLOWING THE TEST CODE.  TEST DATA
                                        ;IS LOADED INTO THE WORK LOCATION.  R0, THE ADDRESSING REGISTER
                                        ;IS LOADED WITH 6 LESS THEN THE ADDRESS OF THE WORK LOCATION.
                                        ;THE MODE 6 SWAB IS EXECUTED WITH A +6 OFFSET.  THE DATA IS
                                        ;VERIFIED WITH A COMPARE.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 177       TEST MODE 6 W/ SWAB INST.
                                        ;*******************************************************************************
```

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



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

```
                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES ALL LEGAL MODES OF THE JMP INSTRUCTION.
                                        ;BECAUSE OF THE NATURE OF THE INSTRUCTION UNDER TEST, THIS TEST
                                        ;UTILIZES SEVERAL DIFFERENT TECHNIQUES.  THE CODE IS NOT EXECUTED
                                        ;IN A LINEAR FASHION.  THE DIFFERENT MODES ARE EXECUTED IN ORDER
                                        ;FROM 1-7; HOWEVER, THE CODE IS ARRANGED SO THAT CONTROL LEAP
                                        ;FROGS THRU THE TEST CODE.  THE ORDER OF APPEARANCE OF THE CODE
                                        ;IS:
                                        ;       JMP MODE 1
                                        ;       JMP MODE 3
                                        ;       JMP MODE 2
                                        ;       JMP MODE 4
                                        ;       JMP MODE 6
                                        ;       JMP MODE 5
                                        ;       JMP MODE 7
                                        ;AN INTERNAL SEQUENCE TEST (JMPSEQ) IS USED TO INSURE THAT THE
                                        ;JUMPS ARE OCCURRING IN THE PROGRAMMED SEQUENCE.
                                        ;       THE TEST IS MADE UP OF SEVERAL BLOCKS OF CODE.  EACH CODE
                                        ;BEGINS WITH A LABEL WHICH INDICATES THE MODE BEING EXECUTED IN
                                        ;THAT BLOCK.  A SIMPLE PROCEDURE IS FOLLOWED IN EACH BLOCK.  FOR
                                        ;EXAMPLE THE CODE BEGINNING AT JMP3 WILL FIRST COMPARE THE RESULTS
                                        ;OF THE PREVIOUS MODE 2 JUMP.  (ANY REGISTER CHANGES ARE VERIFIED
                                        ;AND THE SEQUENCE CHECK IS MADE).  THEN THE REGISTERS ARE SETUP
                                        ;FOR A MODE 3 JUMP TO THE NEXT TEST BLOCK (HERE, JMP4), THE SEQUENCE
                                        ;CHECKER IS UPDATED AND THE JUMP IS EXECUTED.
                                        ;       IF A FAILURE OCCURS, THE SEQUENCE CHECKER WILL ASSIST IN
                                        ;DETERMINING JUST WHICH MODE FAILED.  IF THE SEQUENCE IS CORRECT
                                        ;THEN THE ERROR DETECTED WAS A MODE FAILURE (E.G. FAILURE OF THE
                                        ;REGISTER TO BE INCREMENTED IN MODE 2 JUMP.)
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 201       TEST THE JMP INSTRUCTION IN ALL MODES
                                        ;*******************************************************************************
016042  005212                          TS201:  INC     (R2)            ;UPDATE TEST NUMBER
016044  022712  000201                          CMP     #201,(R2)       ;SEQUENCE ERROR?
016050  001150                                  BNE     JMPCK+6         ;BR TO ERROR HALT ON SEQ ERROR
016052  005067  000326                          CLR     JMPSEQ          ;ESTABLISH A SEQUENCE CHECKER
016056  012700  016136                          MOV     #JMP2,R0        ;SET R0=JUMP TARGET
016062  000110                                  JMP     (R0)            ;TRY JMP MODE 1
016064  022700  016066                  JMP3:   CMP     #.+2,R0         ;CHECK RESULT OF MODE 2 JUMP
016070  001404                                  BEQ     JMP3A
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 767             <====
016072  012742  000407                          MOV     #407,-(R2)      ;MOVE TO MAILBOX #  *******  407  *******
016076  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016100  000000                                  HALT                    ;REGISTER VALUE AFTER JMP MODE 2 INCORRECT
016102  026727  000276  000001          JMP3A:  CMP     JMPSEQ,#1       ;MAKE SURE JMPS ARE IN SEQUENCE: JMPSEQ=1?
016110  001404                                  BEQ     JMP3B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                        ;           WHICH FOLLOWS W/ 757             <====
016112  012742  000410                          MOV     #410,-(R2)      ;MOVE TO MAILBOX #  *******  410  *******
```

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

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

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

016272  022767  000003  000104  JMP5:   CMP     #3,JMPSEQ       ;CHECK THAT JUMPS ARE IN SEQUENCE: JMPSEQ=3?
016300  001404                          BEQ     JMP5A
```

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

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

 016364  026727  000014  000006 JMPCK:   CMP     JMPSEQ,#6      ;CHECK JUMPS IN SEQUENCE: JMPSEQ
 016372  001405                          BEQ     TS202
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 626             <====
 016374  012742  000417                  MOV     #417,-(R2)     ;MOVE TO MAILBOX #  *******  417  *******
 016400  005242                          INC     -(R2)          ;SET MSGTYP TO FATAL ERROR
 016402  000000                          HALT                   ;SHOULD ONLY BE HERE FROM MODE 6 JUMP
                                                                ;  OR SEQUENCE ERROR
 016404  000000                 JMPSEQ:  0
```

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

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

016456  022737  000001  017034     JSR3:   CMP     #1,@# JSRSEQ            ;CHECK SEQUENCE: JSRSEQ=1?
016464  001014                             BNE     JSR3A                   ;BRANCH IF OUT OF SEQUENCE
016466  020127  016620                     CMP     R1,#JSR4                ;PROPER PC SAVED?
016472  001011                             BNE     JSR3A                   ;BRANCH IF PC WRONG
016474  022706  000776                     CMP     #STBOT-2,R6             ;STACK POINTER DECREMENTED?
016500  001006                             BNE     JSR3A                   ;BRANCH IF SP WRONG
016502  022716  125252                     CMP     #125252,(R6)            ;REG SAVED ON STACK?
016506  001003                             BNE     JSR3A                   ;BRANCH IF REG. NOT SAVED
016510  022700  016460                     CMP     #JSR3+2,R0              ;MODE 2 INCREMENT CORRECT?
016514  001404                             BEQ     JSR3B
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                                           ;           CONDITIONAL BRANCH INST. AND  <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION  <====
                                                                           ;           WHICH FOLLOWS W/ 737          <====
016516                             JSR3A:
016516  012742  000421                     MOV     #421,-(R2)              ;MOVE TO MAILBOX #  *******  421  *******
016522  005242                             INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
016524  000000                             HALT                            ;JSR MODE 3 MALFUNCTIONED
```

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

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

016620  022737  000002  017034  JSR4:   CMP     #2,@#JSRSEQ     ;CHECK SEQUENCE: JSRSEQ=2?
016626  001003                          BNE     JSR4A           ;BRANCH IF OUT OF SEQUENCE
016630  022701  016536                  CMP     #JSR2,R1        ;PROPER PC SAVED?
016634  001404                          BEQ     JSR4B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 667            <====
016636                          JSR4A:
016636  012742  000423                  MOV     #423,-(R2)      ;MOVE TO MAILBOX # ******* 423 *******
016642  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016644  000000                          HALT                    ;JSR MODE 3 MALFUNCTIONED
016646  [illegible]237  017034  JSR4B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
016652  [illegible]700  016726          MOV     #JSR5+2,R0      ;SET TARGET ADDRESS
016656  004140                          JSR     R1,-(R0)        ;TRY JSR MODE 4

016660  022767  000004  000146  JSR6:   CMP     #4,JSRSEQ       ;CHECK SEQUENCE: JSRSEQ=4?
016666  001006                          BNE     JSR6A           ;BRANCH IF OUT OF SEQUENCE
016670  022701  016772                  CMP     #JSR7,R1        ;PROPER PC SAVED?
016674  001003                          BNE     JSR6A           ;BRANCH IF PC WRONG
016676  022700  017030                  CMP     #JSR6AD,R0      ;MODE 5 REGISTER CORRECT?
016702  001404                          BEQ     JSR6B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 644            <====
016704                          JSR6A:
016704  012742  000424                  MOV     #424,-(R2)      ;MOVE TO MAILBOX # ******* 424 *******
016710  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
016712  000000                          HALT                    ;JSR MODE 5 FAILED
016714  005237  017034          JSR6B:  INC     @#JSRSEQ        ;UPDATE SEQUENCE CHECKER
```

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

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

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

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




                                ;*******************************************************************************
                                ;
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                                ;       THIS TEST VERIFIES THE RTS INSTRUCTION.  THE STACK POINTER
                                ;IS INITIALIZED AND A TEST PATTERN STORED ON STACK.  R0 IS LOADED
                                ;WITH RETURN ADDRESS.  AN RTS IS EXECUTED, AND, AT THE TARGET
                                ;ADDRESS, A CHECK IS MADE THAT R0 WAS PROPERLY RESTORED FROM THE
                                ;STACK.
                                ;*****************************************************************************
                                ;TEST 203       TEST RTS INSTRUCTION
                                ;*****************************************************************************
017064  005212                  TS203:  INC     (R2)            ;UPDATE TEST NUMBER
017066  022712  000203                  CMP     #203,(R2)       ;SEQUENCE ERROR?
017072  001016                          BNE     TS204-10        ;BR TO ERROR HALT ON SEQ ERROR
017074  012706  001000                  MOV     #STBOT,R6       ;INITIALIZE STACK POINTER
017100  012746  052525                  MOV     #52525,-(R6)    ;INITIALIZE TOP OF STACK
017104  012700  017122                  MOV     #RTS1,R0        ;INITIALIZE RETURN REGISTER
017110  000200                          RTS     R0              ;TRY RTS THROUGH R0
                                                                ; TO SCOPE: REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           FOLLOWING W/ 770               <====
017112  012742  000430                  MOV     #430,-(R2)      ;MOVE TO MAILBOX #  *******  430  *******
017116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017120  000000                          HALT                    ;RTS FAILED
017122  022700  052525          RTS1:   CMP     #52525,R0       ;CHECK THAT R0 RESTORED FROM STACK
017126  001404                          BEQ     TS204
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 761           <====
017130  012742  000431                  MOV     #431,-(R2)      ;MOVE TO MAILBOX #  *******  431  *******
017134  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017136  000000                          HALT                    ;RTS MALFUNCTIONED
                                                                ;  OR SEQUENCE ERROR

                                ;*****************************************************************************
                                ;
                                ;       THESE NEXT FOUR TESTS VERIFY THE FUNCTIONING OF A GROUP
                                ;OF FOUR INSTRUCTIONS.  THE GROUP CONSISTS OF THE INSTRUCTIONS:
                                ;MOV, BIC, BIT, AND BIS.  THESE INSTRUCTIONS ARE SIMILAR IN THE
                                ;WAY THEY EFFECT THE C AND V BITS.  THEY ALL LEAVE THE V-BIT
                                ;CLEAR AND THE C-BIT UNAFFECTED.
                                ;       THE TEST PROCEDURE IS AS FOLLOWS:  THE N, Z, AND V BITS
                                ;ARE LOADED WITH THE COMPLEMENT OF THE EXPECTED RESULTS, THE C-BIT
                                ;IS LOADED WITH THE DESIRED RESULT.  THE INSTRUCTION IS EXECUTED
                                ;WITH DIFFERENT DATA PATTERNS AND THE RESULTS ARE VERIFIED WITH
                                ;A SERIES OF CONDITIONAL BRANCH INSTRUCTIONS.  THE DATA IS CHOSEN
                                ;TO PRODUCT ALL POSSIBLE COMBINATIONS OF THE C AND V BITS.

                                ;*****************************************************************************
                                ;TEST 204       TEST MOV INSTRUCTION
                                ;*****************************************************************************
017140  005212                  TS204:  INC     (R2)            ;UPDATE TEST NUMBER
017142  022712  000204                  CMP     #204,(R2)       ;SEQUENCE ERROR?
017146  001022                          BNE     TS205-10        ;BR TO ERROR HALT ON SEQ ERROR
017150  000277                          SCC                     ;CC=0110
017152  000251                          +CLN!CLC
017154  012700  100000                  MOV     #100000,R0      ;CC=1000
017160  101402                          BLOS    MOV1
017162  102401                          BVS     MOV1
```

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017164  100404                  BMI     MOV2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 770             <====
017166                          MOV1:
017166  012742  000432          MOV     #432,-(R2)      ;MOVE TO MAILBOX #  *******  432  *******
017172  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017174  000000                  HALT                    ;MOV DID NOT SET CC'S CORRECTLY

017176  000277          MOV2:   SCC                     ;CC=1011
017200  000244                  CLZ
017202  012700  000000          MOV     #0,R0           ;CC=0101
017206  101002                  BHI     MOV3            ;C OR Z = 0?
017210  102401                  BVS     MOV3            ;V=1?
017212  100004                  BPL     TS205
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 755             <====
017214                          MOV3:
017214  012742  000433          MOV     #433,-(R2)      ;MOVE TO MAILBOX #  *******  433  *******
017220  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017222  000000                  HALT                    ;MOV DID NOT SET CC'S CORRECTLY
                                                        ;  OR SEQUENCE ERROR
                        ;*************************************************************************************
                        ;TEST 205               TEST BIT INSTRUCTION
                        ;*************************************************************************************
017224  005212          TS205:  INC     (R2)            ;UPDATE TEST NUMBER
017226  022712  000205          CMP     #205,(R2)       ;SEQUENCE ERROR?
017232  001024                  BNE     TS206-10        ;BR TO ERROR HALT ON SEQ ERROR
017234  012700  100001          MOV     #100001,R0
017240  000277                  SCC                     ;CC=0110
017242  000251                  +CLN!CLC
017244  032700  100000          BIT     #100000,R0      ;CC=1000
017250  101402                  BLOS    BIT1
017252  102401                  BVS     BIT1
017254  100404                  BMI     BIT2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 766             <====
017256                          BIT1:
017256  012742  000434          MOV     #434,-(R2)      ;MOVE TO MAILBOX #  *******  434  *******
017262  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017264  000000                  HALT                    ;BIT DID NOT SET CC'S CORRECTLY

017266  000277          BIT2:   SCC                     ;CC=1011
017270  000244                  CLZ
017272  032700  077776          BIT     #77776,R0       ;CC=0101
017276  101002                  BHI     BIT3
017300  102401                  BVS     BIT3
017302  100004                  BPL     TS206
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
```

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                                                                        ;              WHICH FOLLOWS W/ 753             <====
 017304                                 BIT3:
 017304  012742  000435                         MOV     #435,-(R2)      ;MOVE TO MAILBOX #  *******  435  *******
 017310  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 017312  000000                                 HALT                    ;BIT DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR
                                        ;*****************************************************************************
                                        ;TEST 206       TEST BIC INSTRUCTION
                                        ;*****************************************************************************
 017314  005212                         TS206:  INC     (R2)            ;UPDATE TEST NUMBER
 017316  022712  000206                         CMP     #206,(R2)       ;SEQUENCE ERROR?
 017322  001024                                 BNE     TS207-10        ;BR TO ERROR HALT ON SEQ ERROR
 017324  012700  177777                         MOV     #177777,R0
 017330  000277                                 SCC                     ;CC=0110
 017332  000251                                 +CLN!CLC
 017334  042700  077777                         BIC     #77777,R0       ;CC=1000
 017340  101402                                 BLOS    BIC1
 017342  102401                                 BVS     BIC1
 017344  100404                                 BMI     BIC2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 766            <====
 017346                                 BIC1:
 017346  012742  000436                         MOV     #436,-(R2)      ;MOVE TO MAILBOX #  *******  436  *******
 017352  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 017354  000000                                 HALT                    ;BIC DID NOT SET CC'S CORRECTLY
 017356  000277                         BIC2:   SCC                     ;CC=1011
 017360  000244                                 CLZ
 017362  042700  100000                         BIC     #100000,R0      ;CC=0101
 017366  101002                                 BHI     BIC3
 017370  102401                                 BVS     BIC3
 017372  100004                                 BPL     TS207
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 753            <====
 017374                                 BIC3:
 017374  012742  000437                         MOV     #437,-(R2)      ;MOVE TO MAILBOX #  *******  437  *******
 017400  005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
 017402  000000                                 HALT                    ;BIC DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR
                                        ;*****************************************************************************
                                        ;TEST 207       TEST BIS INSTRUCTION
                                        ;*****************************************************************************
 017404  005212                         TS207:  INC     (R2)            ;UPDATE TEST NUMBER
 017406  022712  000207                         CMP     #207,(R2)       ;SEQUENCE ERROR?
 017412  001025                                 BNE     TS210-10        ;BR TO ERROR HALT ON SEQ ERROR
 017414  005000                                 CLR     R0              ;R0=0
 017416  000277                                 SCC                     ;CC=1010
 017420  000251                                 +CLN!CLC
 017422  052700  000000                         BIS     #0,R0           ;CC=0100  R0=0
 017426  103403                                 BCS     BIS1
 017430  102402                                 BVS     BIS1
 017432  100401                                 BMI     BIS1
 017434  001404                                 BEQ     BIS2
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                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 766           <====
017436                          BIS1:
017436  012742  000440                  MOV     #440,-(R2)      ;MOVE TO MAILBOX #  *******  440  *******
017442  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017444  000000                          HALT                    ;BIS DID NOT SET CC'S CORRECTLY
017446  000277                  BIS2:   SCC                     ;CC=0111
017450  000250                          CLN
017452  052700  177777                  BIS     #177777,R0      ;CC=1001
017456  103003                          BCC     BIS3
017460  102402                          BVS     BIS3
017462  001401                          BEQ     BIS3
017464  100404                          BMI     TS210
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                        ;           WHICH FOLLOWS W/ 752           <====
017466                          BIS3:
017466  012742  000441                  MOV     #441,-(R2)      ;MOVE TO MAILBOX #  *******  441  *******
017472  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017474  000000                          HALT                    ;BIS DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR



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

017570  000277           INC4:   SCC                     ;CC=1110
017572  000241                   CLC
017574  005200                   INC     R0              ;CC=0000    R0=1
017576  101402                   BLOS    INC5
017600  100401                   BMI     INC5
017602  100004                   BPL     TS211
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                         ;           CONDITIONAL BRANCH INST. AND      <====
                                                         ;           REPLACE THE MOVE INSTRUCTION      <====
                                                         ;           WHICH FOLLOWS W/ 740              <====
017604                           INC5:
017604  012742  000444           MOV     #444,-(R2)      ;MOVE TO MAILBOX #  *******  444  *******
017610  005242                   INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
017612  000000                   HALT                    ;INC DID NOT SET CC'S CORRECTLY
                                                         ;  OR SEQUENCE ERROR

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

                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 755              <====
017670                          DEC3:
017670  012742  000446                  MOV     #446,-(R2)              ;MOVE TO MAILBOX #  *******  446  *******
017674  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017676  000000                          HALT                            ;DEC DID NOT SET CC'S CORRECTLY
017700  000277                  DEC4:   SCC                             ;CC=0110
017702  000251                          +CLN!CLC
017704  005300                          DEC     R0                      ;CC=1000     R0=177777
017706  101402                          BLOS    DEC5
017710  102401                          BVS     DEC5
017712  100404                          BMI     DEC6

                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 743              <====
017714                          DEC5:
017714  012742  000447                  MOV     #447,-(R2)              ;MOVE TO MAILBOX #  *******  447  *******
017720  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017722  000000                          HALT                            ;DEC DID NOT SET CC'S CORRECTLY
017724  042700  077777          DEC6:   BIC     #77777,R0               ;R0=100000
017730  000277                          SCC                             ;CC=0101
017732  000252                          +CLN!CLV
017734  005300                          DEC     R0                      ;CC=1011     R0=77777
017736  100403                          BMI     DEC7                    ;CC=0011
017740  001402                          BEQ     DEC7
017742  102001                          BVC     DEC7
017744  103404                          BCS     TS212

                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 726              <====
017746                          DEC7:
017746  012742  000450                  MOV     #450,-(R2)              ;MOVE TO MAILBOX #  *******  450  *******
017752  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
017754  000000                          HALT                            ;DEC DID NOT SET CC'S CORRECTLY
                                                                        ;  OR SEQUENCE ERROR




                                ;*******************************************************************************
                                ;
                                ;       THESE NEXT THREE TESTS VERIFY THE FUNCTIONING OF THE CLR,
                                ;TST, AND SWAB INSTRUCTIONS.  THESE THREE INSTRUCTIONS ALL LEAVE
                                ;THE C AND V BITS CLEARED.  AGAIN, THE CONDITION CODES ARE PRESET,
                                ;THE INSTRUCTION EXECUTED AND THE RESULTS CHECKED WITH CONDITIONAL
                                ;BRANCH INSTRUCTIONS.  THE PROCEDURE IS REPEATED TO PRODUCE OTHER
                                ;COMBINATIONS OF CONDITION CODES.
```

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                                    ;
                                    ;*******************************************************************************
                                    ;TEST 212         TEST CLR INSTRUCTION
                                    ;*******************************************************************************
017756  005212                      TS212:  INC     (R2)            ;UPDATE TEST NUMBER
017760  022712  000212                      CMP     #212,(R2)       ;SEQUENCE ERROR?
017764  001007                              BNE     TS213-10        ;BR TO ERROR HALT ON SEQ ERROR
017766  000277                              SCC                     ;CC=1011
017770  000244                              CLZ
017772  005000                              CLR     R0              ;CC=0100   R0=0
017774  100403                              BMI     CLR1
017776  102402                              BVS     CLR1
020000  103401                              BCS     CLR1
020002  001404                              BEQ     TS213
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                    ;           CONDITIONAL BRANCH INST. AND      <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                    ;           WHICH FOLLOWS W/ 770              <====
020004                              CLR1:
020004  012742  000451                      MOV     #451,-(R2)      ;MOVE TO MAILBOX #  *******  451  *******
020010  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020012  000000                              HALT                    ;CLR DID NOT SET CC'S CORRECTLY
                                                                    ;  OR SEQUENCE ERROR

                                    ;*******************************************************************************
                                    ;TEST 213         TEST TST INSTRUCTION
                                    ;*******************************************************************************
020014  005212                      TS213:  INC     (R2)            ;UPDATE TEST NUMBER
020016  022712  000213                      CMP     #213,(R2)       ;SEQUENCE ERROR?
020022  001022                              BNE     TS214-10        ;BR TO ERROR HALT ON SEQ ERROR
020024  000277                              SCC                     ;CC=1011
020026  000244                              CLZ
020030  005700                              TST     R0              ;CC=0100
020032  100403                              BMI     TEST1
020034  102402                              BVS     TEST1
020036  103401                              BCS     TEST1
020040  001404                              BEQ     TEST2
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                    ;           CONDITIONAL BRANCH INST. AND      <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                    ;           WHICH FOLLOWS W/ 770              <====
020042                              TEST1:
020042  012742  000452                      MOV     #452,-(R2)      ;MOVE TO MAILBOX #  *******  452  *******
020046  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020050  000000                              HALT                    ;TEST DID NOT SET CC'S CORRECTLY
020052  005300                      TEST2:  DEC     R0              ;MAKE R0 NEGATIVE
020054  000277                              SCC                     ;CC=0111
020056  000250                              CLN
020060  005700                              TST     R0              ;CC=1000
020062  101402                              BLOS    TEST3
020064  102401                              BVS     TEST3
020066  100404                              BMI     TS214
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                    ;           CONDITIONAL BRANCH INST. AND      <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                    ;           WHICH FOLLOWS W/ 755              <====
```

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


                                         ;*************************************************************************
                                         ;
                                         ;        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
                                         ;*************************************************************************
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020166  005212                   TS215:  INC     (R2)            ;UPDATE TEST NUMBER
020170  022712  000215                   CMP     #215,(R2)       ;SEQUENCE ERROR?
020174  001062                           BNE     TS216-10        ;BR TO ERROR HALT ON SEQ ERROR
020176  012700  040000                   MOV     #40000,R0       ;R0=40000
020202  000277                           SCC                     ;CC=1111
020204  062700  030000                   ADD     #30000,R0       ;CC=0000   R0=70000
020210  101402                           BLOS    ADD1
020212  102401                           BVS     ADD1
020214  100004                           BPL     ADD2

                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 767             <====
020216                           ADD1:
020216  012742  000456                   MOV     #456,-(R2)      ;MOVE TO MAILBOX #  *******  456  *******
020222  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020224  000000                           HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020226  000264                   ADD2:   SEZ                     ;CC=0100

020230  062700  010000                   ADD     #10000,R0       ;CC=1010   40=100000
020234  101402                           BLOS    ADD3
020236  102001                           BVC     ADD3
020240  100404                           BMI     ADD4

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

                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 742             <====
020270                           ADD5:
020270  012742  000460                   MOV     #460,-(R2)      ;MOVE TO MAILBOX #  *******  460  *******
020274  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020276  000000                           HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020300  062700  177777           ADD6:   ADD     #177777,R0      ;CC=1000   R0=177777
020304  101402                           BLOS    ADD7
020306  102401                           BVS     ADD7
020310  100404                           BMI     ADD8

                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 731             <====
020312                           ADD7:
020312  012742  000461                   MOV     #461,-(R2)      ;MOVE TO MAILBOX #  *******  461  *******
020316  005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
020320  000000                  HALT                    ;ADD DID NOT SET CC'S CORRECTLY
020322  000277          ADD8:   SCC                     ;CC=1010
020324  000245                  +CLC!CLZ
020326  062700  000001          ADD     #1,R0           ;CC=0101   R=0
020332  102403                  BVS     ADD9
020334  103002                  BCC     ADD9
020336  100401                  BMI     ADD9
020340  001404                  BEQ     TS216

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                        ;           WHICH FOLLOWS W/ 715              <====
020342                          ADD9:
020342  012742  000462          MOV     #462,-(R2)      ;MOVE TO MAILBOX #  *******  462  *******
020346  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020350  000000                  HALT                    ;ADD DID NOT SET CC'S CORRECTLY
                                                        ;  OR SEQUENCE ERROR

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



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

                                ;*******************************************************************************
                                ;TEST 220         TEST CMP INSTRUCTION
                                ;*******************************************************************************
020614  005212                  TS220:  INC     (R2)             ;UPDATE TEST NUMBER
020616  022712  000220                  CMP     #220,(R2)        ;SEQUENCE ERROR?
020622  001060                          BNE     TS221-10         ;BR TO ERROR HALT ON SEQ ERROR
020624  012700  000005                  MOV     #5,R0
020630  000257                          CCC                      ;CC=1010
020632  000271                          +SEN!SEC
020634  022700  000005                  CMP     #5,R0            ;CC=0101
020640  101002                          BHI     CMP1
020642  102401                          BVS     CMP1
020644  100004                          BPL     CMP2
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                         ;           CONDITIONAL BRANCH INST. AND   <====
                                                         ;           REPLACE THE MOVE INSTRUCTION   <====
                                                         ;           WHICH FOLLOWS W/ 766           <====
020646                          CMP1:
020646  012742  000471                  MOV     #471,-(R2)       ;MOVE TO MAILBOX #  *******  471  *******
020652  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
020654  000000                          HALT                     ;CMP DID NOT SET CC'S CORRECTLY
020656  012700  100000          CMP2:   MOV     #100000,R0
020662  000277                          SCC                      ;CC=1101
020664  000242                          CLV
020666  020027  077777                  CMP     R0,#77777        ;CC=0010
020672  101402                          BLOS    CMP3
020674  102001                          BVC     CMP3
020676  100004                          BPL     CMP4
                                                         ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                         ;           CONDITIONAL BRANCH INST. AND   <====
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                                                    ;               REPLACE THE MOVE INSTRUCTION    <====
                                                    ;               WHICH FOLLOWS W/ 751            <====
020700                          CMP3:
020700  012742  000472                  MOV     #472,-(R2)      ;MOVE TO MAILBOX #  *******  472  *******
020704  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020706  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020710  052700  040000          CMP4:   BIS     #40000,R0       ;R0=140000
020714  000257                          CCC                     ;CC=0100
020716  000264                          SEZ
020720  022700  040000                  CMP     #40000,R0       ;CC=1011
020724  102003                          BVC     CMP5
020726  103002                          BCC     CMP5
020730  001401                          BEQ     CMP5
020732  100404                          BMI     CMP6
                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                    ;               CONDITIONAL BRANCH INST. AND    <====
                                                    ;               REPLACE THE MOVE INSTRUCTION    <====
                                                    ;               WHICH FOLLOWS W/ 733            <====
020734                          CMP5:
020734  012742  000473                  MOV     #473,-(R2)      ;MOVE TO MAILBOX #  *******  473  *******
020740  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020742  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
020744  042700  040000          CMP6:   BIC     #40000,R0
020750  000277                          SCC                     ;CC=1111
020752  022700  177777                  CMP     #-1,R0          ;CC=0000
020756  101402                          BLOS    CMP7
020760  102401                          BVS     CMP7
020762  100004                          BPL     TS221
                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                    ;               CONDITIONAL BRANCH INST. AND    <====
                                                    ;               REPLACE THE MOVE INSTRUCTION    <====
                                                    ;               WHICH FOLLOWS W/ 717            <====
020764                          CMP7:
020764  012742  000474                  MOV     #474,-(R2)      ;MOVE TO MAILBOX #  *******  474  *******
020770  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
020772  000000                          HALT                    ;CMP DID NOT SET CC'S CORRECTLY
                                                                ;  OR SEQUENCE ERROR

                                ;*******************************************************************************
                                ;TEST 221               TEST COM INSTRUCTION
                                ;*******************************************************************************
020774  005212                  TS221:  INC     (R2)            ;UPDATE TEST NUMBER
020776  022712  000221                  CMP     #221,(R2)       ;SEQUENCE ERROR?
021002  001010                          BNE     TS222-10        ;BR TO ERROR HALT ON SEQ ERROR
021004  012700  177777                  MOV     #-1,R0
021010  000257                          CCC                     ;CC=1010
021012  000265                          +SEC!SEZ
021014  005100                          COM     R0              ;CC=0101
021016  101002                          BHI     COM1
021020  102401                          BVS     COM1
021022  100004                          BPL     TS222
                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                    ;               CONDITIONAL BRANCH INST. AND    <====
                                                    ;               REPLACE THE MOVE INSTRUCTION    <====
                                                    ;               WHICH FOLLOWS W/ 767            <====
021024                          COM1:
```

```
021024  012742  000475          MOV     #475,-(R2)      ;MOVE TO MAILBOX #  *******  475  *******
021030  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021032  000000                  HALT                    ;COM DID NOT SET CC'S CORRECTLY
                                                        ;  OR SEQUENCE ERROR



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

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021134  162700  100000              SUB     #100000,R0          ;CC=0000   R0=77777
021140  101402                      BLOS    SUB5
021142  102401                      BVS     SUB5
021144  100004                      BPL     SUB6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 736            <====
021146                      SUB5:
021146  012742  000500              MOV     #500,-(R2)          ;MOVE TO MAILBOX #  *******  500  *******
021152  005242                      INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
021154  000000                      HALT                        ;SUB DID NOT SET CC'S CORRECTLY
021156  000257              SUB6:   CCC                         ;CC=0100
021160  000264                      SEZ
021162  162700  140000              SUB     #140000,R0          ;CC=1011
021166  102003                      BVC     SUB7
021170  103002                      BCC     SUB7
021172  001401                      BEQ     SUB7
021174  100404                      BMI     TS223
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 722            <====
021176                      SUB7:
021176  012742  000501              MOV     #501,-(R2)          ;MOVE TO MAILBOX #  *******  501  *******
021202  005242                      INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
021204  000000                      HALT                        ;

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



                                ;*******************************************************************************
                                ;
                                ;       THESE NEXT FOUR TESTS VERIFY THE FUNCTIONING OF THE ROL,
                                ;ROR, ASL AND ASR INSTRUCTIONS.  SPECIAL DATA PATTERNS ARE LOADED
                                ;AND ROTATED SEVERAL TIMES FOR EACH TEST.  THE CONDITION CODES
                                ;ARE PRESET BEFORE EACH ROTATION AND THE CONDITION CODES ARE
                                ;CHECKED AFTER EACH ROTATION.  THE FINAL CHECK IN EACH TEST IS
                                ;TO VERIFY THE COMMULATIVE DATA RESULT.  THE DATA PATTERNS HAVE
                                ;BEEN SELECTED TO PRODUCE ALL COMBINATIONS OF THE C AND V BITS.
                                ;
                                ;*******************************************************************************
                                ;TEST 224       TEST ROL INSTRUCTION
                                ;*******************************************************************************
021354  005212                  TS224:  INC     (R2)            ;UPDATE TEST NUMBER
```

```
021356  022712  000224           CMP     #224,(R2)        ;SEQUENCE ERROR?
021362  001053                   BNE     TS225-10         ;BR TO ERROR HALT ON SEQ ERROR
021364  012700  144000           MOV     #144000,R0       ;R0=144000
021370  000257                   CCC                      ;CC=0110
021372  000266                   +SEZ!SEV
021374  006100                   ROL     R0               ;CC=1001   R0=110000
021376  103003                   BCC     ROL1
021400  102402                   BVS     ROL1
021402  001401                   BEQ     ROL1
021404  100404                   BMI     ROL2
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 766             <====
021406                   ROL1:
021406  012742  000506           MOV     #506,-(R2)       ;MOVE TO MAILBOX #  *******  506  *******
021412  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
021414  000000                   HALT                     ;
021416  000277           ROL2:   SCC                      ;CC=1100
021420  000243                   +CLV!CLC
021422  006100                   ROL     R0               ;CC=0011   R0=020000
021424  103003                   BCC     ROL3
021426  102002                   BVC     ROL3
021430  001401                   BEQ     ROL3
021432  100004                   BPL     ROL4
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 753             <====
021434                   ROL3:
021434  012742  000507           MOV     #507,-(R2)       ;MOVE TO MAILBOX #  *******  507  *******
021440  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
021442  000000                   HALT                     ;ROL DID NOT SET CC'S CORRECTLY
021444  000277           ROL4:   SCC                      ;CC=0111
021446  000250                   CLN
021450  006100                   ROL     R0               ;CC=0000   R0=040001
021452  101402                   BLOS    ROL5
021454  102401                   BVS     ROL5
021456  100004                   BPL     ROL6
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 741             <====
021460                   ROL5:
021460  012742  000510           MOV     #510,-(R2)       ;MOVE TO MAILBOX #  *******  510  *******
021464  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
021466  000000                   HALT                     ;ROL DID NOT SET CC'S CORRECTLY
021470  000257           ROL6:   CCC                      ;CC=0101
021472  000265                   +SEZ!SEC
021474  006100                   ROL     R0               ;CC=1010   R0=100003
021476  101405                   BLOS    ROL7
021500  102004                   BVC     ROL7
021502  100003                   BPL     ROL7
021504  022700  100003           CMP     #100003,R0
021510  001404                   BEQ     TS225
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
```

```
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 724            <====
021512                          ROL7:
021512  012742  000511                  MOV     #511,-(R2)      ;MOVE TO MAILBOX #  *******  511  *******
021516  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021520  000000                          HALT                    ;ROL MALFUNCTIONED
                                                                ;  OR SEQUENCE ERROR

                                ;*************************************************************************
                                ;TEST 225       TEST ROR INSTRUCTION
                                ;*************************************************************************
021522  005212                  TS225:  INC     (R2)            ;UPDATE TEST NUMBER
021524  022712  000225                  CMP     #225,(R2)       ;SEQUENCE ERROR?
021530  001051                          BNE     TS226-10        ;BR TO ERROR HALT ON SEQ ERROR
021532  012700  000023                  MOV     #23,R0          ;R0=23
021536  000277                          SCC                     ;CC=0111
021540  000250                          CLN
021542  006000                          ROR     R0              ;CC=1001    R0=100011
021544  102403                          BVS     ROR1
021546  103002                          BCC     ROR1
021550  001401                          BEQ     ROR1
021552  100404                          BMI     ROR2

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 766            <====
021554                          ROR1:
021554  012742  000512                  MOV     #512,-(R2)      ;MOVE TO MAILBOX #  *******  512  *******
021560  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021562  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021564  000257                  ROR2:   CCC                     ;CC=1100
021566  000274                          +SEN!SEZ
021570  006000                          ROR     R0              ;CC=0011    R0=040004
021572  102003                          BVC     ROR3
021574  103002                          BCC     ROR3
021576  001401                          BEQ     ROR3
021600  100004                          BPL     ROR4

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 753            <====
021602                          ROR3:
021602  012742  000513                  MOV     #513,-(R2)      ;MOVE TO MAILBOX #  *******  513  *******
021606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021610  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021612  000277                  ROR4:   SCC                     ;CC=1110
021614  000241                          CLC
021616  006000                          ROR     R0              ;CC=0000    R0=020002
021620  101403                          BLOS    ROR5
021622  102402                          BVS     ROR5
021624  001401                          BEQ     ROR5
021626  100004                          BPL     ROR6

                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 740            <====
```

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021630                          ROR5:
021630  012742  000514                  MOV     #514,-(R2)      ;MOVE TO MAILBOX #  *******  514  *******
021634  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021636  000000                          HALT                    ;ROR DID NOT SET CC'S CORRECTLY
021640  000257                  ROR6:   CCC                     ;CC=0101
021642  000265                          +SEC!SEZ
021644  006000                          ROR     R0              ;CC=1010   R0=110001
021646  101402                          BLOS    ROR7
021650  102001                          BVC     ROR7
021652  100404                          BMI     TS226
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 726            <====
021654                          ROR7:
021654  012742  000515                  MOV     #515,-(R2)      ;MOVE TO MAILBOX #  *******  515  *******
021660  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021662  000000                          HALT                    ;ROR DID NOT PRODUCE CORRECT RESULTS
                                                                ;  OR SEQUENCE ERROR
                                ;*************************************************************************
                                ;TEST 226        TEST ASL INSTRUCTION
                                ;*************************************************************************
021664  005212                  TS226:  INC     (R2)            ;UPDATE TEST NUMBER
021666  022712  000226                  CMP     #226,(R2)       ;SEQUENCE ERROR?
021672  001054                          BNE     TS227-10        ;BR TO ERROR HALT ON SEQ ERROR
021674  012700  144000                  MOV     #144000,R0      ;R0=14000
021700  000257                          CCC                     ;CC=0110
021702  000271                          +SEN!SEC
021704  006300                          ASL     R0              ;CC=1001   R0=110000
021706  103003                          BCC     ASL1
021710  102402                          BVS     ASL1
021712  001401                          BEQ     ASL1
021714  100404                          BMI     ASL2
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
021716                          ASL1:
021716  012742  000516                  MOV     #516,-(R2)      ;MOVE TO MAILBOX #  *******  516  *******
021722  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021724  000000                          HALT                    ;
021726  000277                  ASL2:   SCC                     ;CC=1100
021730  000243                          +CLV!CLC
021732  006300                          ASL     R0              ;CC=0011   R0=020000
021734  103003                          BCC     ASL3
021736  102002                          BVC     ASL3
021740  001401                          BEQ     ASL3
021742  100004                          BPL     ASL4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 753            <====
021744                          ASL3:
021744  012742  000517                  MOV     #517,-(R2)      ;MOVE TO MAILBOX #  *******  517  *******
021750  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
021752  000000                          HALT                    ;ASL DID NOT SET CC'S CORRECTLY
```

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

                        ;*******************************************************************************
                        ;TEST 227          TEST ASR INSTRUCTION
                        ;*******************************************************************************
022034  005212          TS227:  INC     (R2)            ;UPDATE TEST NUMBER
022036  022712  000227          CMP     #227,(R2)       ;SEQUENCE ERROR?
022042  001060                  BNE     TS230-10        ;BR TO ERROR HALT ON SEQ ERROR
022044  012700  100023          MOV     #100023,R0      ;R0=100023
022050  000277                  SCC                     ;CC=0110
022052  000250                  CLN
022054  006200                  ASR     R0              ;CC=1001   RP=140011
022056  102403                  BVS     ASR1
022060  103002                  BCC     ASR1
022062  001401                  BEQ     ASR1
022064  100404                  BMI     ASR2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                        ;           CONDITIONAL BRANCH INST. AND     <====
                                                        ;           REPLACE THE MOVE INSTRUCTION     <====
                                                        ;           WHICH FOLLOWS W/ 766             <====
022066                          ASR1:
022066  012742  000522          MOV     #522,-(R2)      ;MOVE TO MAILBOX #  *******  522  *******
022072  005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022074  000000                  HALT                    ;ASR DID NOT SET CC'S CORRECTLY
022076  042700  100000  ASR2:   BIC     #100000,R0      ;R0=40011
```

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022102  000277                          SCC                             ;CC=1100
022104  000243                          +CLV!CLC
022106  006200                          ASR     R0                      ;CC=0011   R0=020004
022110  102003                          BVC     ASR3
022112  103002                          BCC     ASR3
022114  001401                          BEQ     ASR3
022116  100004                          BPL     ASR4
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 751            <====
022120                          ASR3:
022120  012742  000523                  MOV     #523,-(R2)              ;MOVE TO MAILBOX #  *******  523  *******
022124  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
022126  000000                          HALT                            ;ASR DID NOT SET CC'S CORRECTLY
022130  000277                  ASR4:   SCC                             ;CC=1111

022132  006200                          ASR     R0                      ;CC=0000   R0=010002
022134  101403                          BLOS    ASR5
022136  102402                          BVS     ASR5
022140  001401                          BEQ     ASR5
022142  100004                          BPL     ASR6
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 737            <====
022144                          ASR5:
022144  012742  000524                  MOV     #524,-(R2)              ;MOVE TO MAILBOX #  *******  524  *******
022150  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
022152  000000                          HALT                            ;ASR DID NOT SET CC'S CORRECTLY
022154  052700  100000          ASR6:   BIS     #100000,R0              ;R0=110002
022160  000257                          CCC                             ;CC=0101
022162  000265                          +SEZ!SEC
022164  006200                          ASR     R0                      ;C=1010   R0=144001
022166  101406                          BLOS    ASR7
022170  102005                          BVC     ASR7
022172  100004                          BPL     ASR7
022174  001403                          BEQ     ASR7
022176  022700  144001                  CMP     #144001,R0              ;CHECK RESULT OF ASR'S
022202  001404                          BEQ     TS230
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 717            <====
022204                          ASR7:
022204  012742  000525                  MOV     #525,-(R2)              ;MOVE TO MAILBOX #  *******  525  *******
022210  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
022212  000000                          HALT                            ;ASR DID NOT FUNCTION CORRECTLY
                                                                        ;  OR SEQUENCE ERROR



                                ;******************************************************************************
                                ;
                                ;       THIS TEST VERIFIES THE SXT INSTRUCTION. CONDITION CODES
                                ;ARE PRESET IN EACH OF THE TWO POSSIBLE CASES. WITH THE N-BIT SET,
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```
                                        ;THE TEST CHECKS FOR ALL ONES IN THE DESTINATION. WITH THE N-BIT
                                        ;CLEAR, THE DESTINATION SHOULD CONTAIN ALL ZEROES. THE DATA
                                        ;IS VERIFIED BY CONDITIONAL BRANCHES.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 230        TEST THE SXT INSTRUCTION
                                        ;*******************************************************************************
022214  005212                          TS230:  INC     (R2)            ;UPDATE TEST NUMBER
022216  022712  000230                          CMP     #230,(R2)       ;SEQUENCE ERROR?
022222  001033                                  BNE     TS231-10        ;BR TO ERROR HALT ON SEQ ERROR
022224  005000                                  CLR     R0
022226  000277                                  SCC                     ;SET CC=1011
022230  000244                                  CLZ
022232  006700                                  SXT     R0              ;TRY SXT
022234  100006                                  BPL     SXT0            ;TEST CC=1001
022236  001405                                  BEQ     SXT0
022240  102404                                  BVS     SXT0
022242  103003                                  BCC     SXT0
022244  022700  177777                          CMP     #-1,R0          ;CHECK DATA RESULT
022250  001404                                  BEQ     SXT1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 764            <====
022252                                  SXT0:
022252  012742  000526                          MOV     #526,-(R2)      ;MOVE TO MAILBOX #  *******  526  *******
022256  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022260  000000                                  HALT                    ;RESULTS OF SXT INCORRECT
022262  005000                          SXT1:   CLR     R0              ;R0=0
022264  005010                                  CLR     (R0)            ;LOC. 0=0
022266  005110                                  COM     (R0)            ;LOC. 0=177777
022270  000257                                  CCC                     ;SET CC=0110
022272  000266                                  +SEZ!SEV
022274  006710                                  SXT     (R0)
022276  001005                                  BNE     SXT2            ;TEST CC=0100
022300  103404                                  BCS     SXT2
022302  102403                                  BVS     SXT2
022304  100402                                  BMI     SXT2
022306  005710                                  TST     (R0)
022310  001404                                  BEQ     TS231
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 744            <====
022312                                  SXT2:
022312  012742  000527                          MOV     #527,-(R2)      ;MOVE TO MAILBOX #  *******  527  *******
022316  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022320  000000                                  HALT                    ;RESULTS OF SXT INCORRECT
                                                                        ;  OR SEQUENCE ERROR


                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE XOR INSTRUCTION. UNIQUE PATTERNS
                                        ;OF ONES AND ZEROES ARE MOVED TO DATA REGISTERS R0 AND R1.
                                        ;AFTER THE FIRST XOR INSTRUCTION R0=36146. AN XOR IS THEN
                                        ;EXECUTED WITH THIS NEW VALUE AND THE CONTENTS OF R1 TO
```

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

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE SOB INSTRUCTION. R4 IS USED AS A
                                        ;COUNTER WHILE R0 IS THE ADDRESS REGISTER. CONDITIONAL
                                        ;BRANCHES ARE USED TO VERIFY PROPER TRANSFER OF CONTROL
                                        ;WHILE R4 IS CHECKED TO INSURE PROPER DECREMENTING OF R0.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 232         TEST SOB INSTRUCTION
```

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


                                ;*******************************************************************************
                                ;
                                ;           THIS TEST VERIFIES THE MARK INSTRUCTION. THE EFFECTS
                                ;OF THE MARK INSTRUCTION ARE SIMULATED BY THE PROGRAM INSTRUCTIONS.
                                ;THE CONTENTS OF R5 AND THE STACK POINTER ARE CHECKED AFTER EACH
                                ;OF THE TWO ROUTINES IN THE TEST.
                                ;
                                ;*******************************************************************************
                                ;TEST 233       TEST MARK INSTRUCTION
                                ;*******************************************************************************
022522  005212                  TS233:  INC     (R2)            ;UPDATE TEST NUMBER
022524  022712  000233                  CMP     #233,(R2)       ;SEQUENCE ERROR?
022530  001061                          BNE     TS234-10        ;BR TO ERROR HALT ON SEQ ERROR
022532  012706  001000                  MOV     #STBOT,SP
022536  012746  125252                  MOV     #125252,-(SP)   ;PUT R5 VALUE ON STACK
022542  162706  000074                  SUB     #74,SP          ;EFFECTIVELY PUT 36 ARGUMENTS ON STACK
022546  012705  022572                  MOV     #MRK1,R5        ;SET NEW PC IN R5
022552  012746  006436                  MOV     #6436,-(SP)     ;PUT MARK 36 INST. ON STACK
022556  000277                          SCC                     ;SET CC=1111
022560  000116                          JMP     (SP)            ;XFER CONTL TO MARK 36 INST. ON STACK
```

```
022562  012742  000534                  MOV     #534,-(R2)      ;MOVE TO MAILBOX #  *******  534  *******
022566  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022570  000000                          HALT                    ;MARK INST. SHOULD HAVE JUMPED TO MRK1
022572  101010                  MRK1:   BHI     MRK2            ;TEST CC UNAFFECTED
022574  100007                          BPL     MRK2            ;IE. CC=1111
022576  102006                          BVC     MRK2
022600  020527  125252                  CMP     R5,#125252      ;CHECK R5 RESTORED FROM STACK
022604  001003                          BNE     MRK2
022606  022706  001000                  CMP     #STBOT,R6       ;CHECK STACK POINTER READJUSTED CORRECTLY.
022612  001404                          BEQ     MRK3
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 746             <====
022614                          MRK2:
022614  012742  000535                  MOV     #535,-(R2)      ;MOVE TO MAILBOX #  *******  535  *******
022620  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022622  000000                          HALT                    ;RESULTS OF MARK INCORRECT
022624  012746  052525          MRK3:   MOV     #52525,-(SP)
022630  012746  006400                  MOV     #6400,-(SP)     ;PUT MARK 0 INST. ON STACK
022634  010605                          MOV     SP,R5           ;SET ADDR. OF MARK INST. IN R5
022636  004737  022646                  JSR     PC,@#MRK4       ;DO JSR
022642  000137  022660                  JMP     @#MRK5          ;
022646  000205                  MRK4:   RTS     R5              ;DO RTS WITH R5 TO MARK INST ON STACK
022650  012742  000536                  MOV     #536,-(R2)      ;MOVE TO MAILBOX #  *******  536  *******
022654  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022656  000000                          HALT                    ;RTS,MARK SEQUENCE FAILED
022660  022706  001000          MRK5:   CMP     #STBOT,R6       ;STACK ADJUSTED CORRECTLY
022664  001003                          BNE     MRK6            ;IF NOT:  BR
022666  022705  052525                  CMP     #52525,R5       ;CHECK IF R5 RESTORED FROM STACK
022672  001404                          BEQ     TS234
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 716             <====
022674                          MRK6:
022674  012742  000537                  MOV     #537,-(R2)      ;MOVE TO MAILBOX #  *******  537  *******
022700  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022702  000000                          HALT                    ;RESULTS OF MARK INCORRECT
                                                                ;  OR SEQUENCE ERROR

        177776                          PS=177776
                                ;*****************************************************************************
                                ;
                                ;       THESE NEXT SEVEN TESTS VERIFY THE MTPS INSTRUCTION IN ALL
                                ;       MODES. THE PSW IS DEFINED BY AN EQUATE STATEMENT BEFORE THE
                                ;       FIRST MTPS TEST. IN EACH TEST A PATTERN OF ONES AND
                                ;       ZEROES IS SET IN A DATA REGISTER AND MOVED TO THE PSW.
                                ;       THE DATA IN THE PSW, AND THE DATA REGISTER ADDRESS,
                                ;       ARE CHECKED TO VERIFY PROPER EXECUTION OF THE INSTRUCTION.
                                ;
                                ;*****************************************************************************
                                ;TEST 234       TEST MTPS INSTRUCTION
                                ;*****************************************************************************
022704  005212                  TS234:  INC     (R2)            ;UPDATE TEST NUMBER
022706  022712  000234                  CMP     #234,(R2)       ;SEQUENCE ERROR?
```

```
022712  001024                            BNE     TS235-10        ;BR TO ERROR HALT ON SEQ ERROR
022714  012700  000377                    MOV     #377,R0
022720  000257                            CCC
022722  106400                            MTPS    R0
022724  022767  000357  155044            CMP     #357,PS
022732  001404                            BEQ     MTPS1
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                   ;           CONDITIONAL BRANCH INST. AND      <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                   ;           WHICH FOLLOWS W/ 767              <====
022734  012742  000540                    MOV     #540,-(R2)      ;MOVE TO MAILBOX #  *******  540  *******
022740  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022742  000000                            HALT                    ;MTPS FAILED
022744  005000                    MTPS1:  CLR     R0
022746  005010                            CLR     (R0)
022750  000277                            SCC                     ;CC=1111
022752  106410                            MTPS    (R0)            ;TRY MTPS MODE 1
022754  100403                            BMI     MTPS1A          ;CHECK PS
022756  102402                            BVS     MTPS1A
022760  103401                            BCS     MTPS1A
022762  001004                            BNE     TS235
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                   ;           CONDITIONAL BRANCH INST. AND      <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                   ;           WHICH FOLLOWS W/ 753              <====
022764                            MTPS1A:
022764  012742  000541                    MOV     #541,-(R2)      ;MOVE TO MAILBOX #  *******  541  *******
022770  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
022772  000000                            HALT                    ;MTPS FAILED
                                                                   ;  OR SEQUENCE ERROR

                                  ;*****************************************************************************
                                  ;TEST 235         TEST MTPS MODE 2
                                  ;*****************************************************************************
022774  005212                    TS235:  INC     (R2)            ;UPDATE TEST NUMBER
022776  022712  000235                    CMP     #235,(R2)       ;SEQUENCE ERROR?
023002  001021                            BNE     TS236-10        ;BR TO ERROR HALT ON SEQ ERROR
023004  005000                            CLR     R0              ;R0=0
023006  012710  177777                    MOV     #-1,(R0)        ;LOC. 0=-1
023012  005037  177776                    CLR     @#PS            ;PS=0
023016  106420                            MTPS    (R0)+           ;TRY MTPS W/MODE 2
023020  022737  000357  177776            CMP     #357,@#PS       ;CHECK DATA
023026  001404                            BEQ     MTPS2
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                   ;           CONDITIONAL BRANCH INST. AND      <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                   ;           WHICH FOLLOWS W/ 765              <====
023030  012742  000542                    MOV     #542,-(R2)      ;MOVE TO MAILBOX #  *******  542  *******
023034  005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023036  000000                            HALT                    ;DEST. DATA INCORRECT
023040  022700  000001            MTPS2:  CMP     #1,R0           ;CHECK DEST. REGISTER.
023044  001404                            BEQ     TS236
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                   ;           CONDITIONAL BRANCH INST. AND      <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                   ;           WHICH FOLLOWS W/ 756              <====
```

```
023046  012742  000543                  MOV     #543,-(R2)      ;MOVE TO MAILBOX #  *******  543  *******
023052  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023054  000000                          HALT                    ;DEST REGISTER NOT INCREMENTED BY 1
                                                                ;  OR SEQUENCE ERROR

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

                                ;*******************************************************************************
                                ;TEST 237       TEST MTPS MODE 4
                                ;*******************************************************************************
023146  005212                  TS237:  INC     (R2)            ;UPDATE TEST NUMBER
023150  022712  000237                  CMP     #237,(R2)       ;SEQUENCE ERROR?
023154  001022                          BNE     TS240-10        ;BR TO ERROR HALT ON SEQ ERROR
023156  012700  000001                  MOV     #1,R0           ;R0=1
023162  012737  125125  000000          MOV     #125125,@#0     ;LOC. 0 = 125125
023170  005037  177776                  CLR     @#PS            ;PS=0
023174  106440                          MTPS    -(R0)           ;TRY MTPS W/MODE 4
023176  022737  000105  177776          CMP     #105,@#PS       ;CHECK DEST. DATA
023204  001404                          BEQ     MTPS4
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 763            <====
023206  012742  000546                  MOV     #546,-(R2)      ;MOVE TO MAILBOX #  *******  546  *******
023212  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023214  000000                          HALT                    ;DEST. DATA INCORRECT
023216  005700                  MTPS4:  TST     R0              ;CHECK MODE 4 REGISTER
```

```
023220  001404                          BEQ     TS240
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 755             <====
023222  012742  000547                  MOV     #547,-(R2)      ;MOVE TO MAILBOX #  *******  547  *******
023226  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023230  000000                          HALT                    ;MODE 4 REGISTER NOT DECREMENTED BY 1
                                                                ;  OR SEQUENCE ERROR

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

                                ;*******************************************************************************
                                ;TEST 241        TEST MTPS MODE 6
                                ;*******************************************************************************
023314  005212                  TS241:  INC     (R2)            ;UPDATE TEST NUMBER
023316  022712  000241                  CMP     #241,(R2)       ;SEQUENCE ERROR?
023322  001024                          BNE     TS242-10        ;BR TO ERROR HALT ON SEQ ERROR
023324  012737  052652  000000          MOV     #52652,@#0      ;LOC. 0=52652
023332  012700  000406                  MOV     #406,R0         ;R0=406
023336  005037  177776                  CLR     @#PS            ;PS=0
023342  106460  177372                  MTPS    -406(R0)        ;TRY MTPS W/MODE 6
023346  022737  000252  177776          CMP     #252,@#PS       ;CHECK DEST. DATA
023354  001404                          BEQ     MTPS6
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 762             <====
```

```
023356  012742  000552                      MOV     #552,-(R2)      ;MOVE TO MAILBOX #  *******  552  *******
023362  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023364  000000                              HALT                    ;DEST. DATA INCORRECT
023366  022700  000406          MTPS6:      CMP     #406,R0         ;CHECK MODE 6 REGISTER
023372  001404                              BEQ     TS242
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 753             <====
023374  012742  000553                      MOV     #553,-(R2)      ;MOVE TO MAILBOX #  *******  553  *******
023400  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023402  000000                              HALT                    ;MODE 6 REGISTER MODIFIED
                                                                    ;  OR SEQUENCE ERROR

                                ;*****************************************************************************
                                ;TEST 242          TEST MTPS MODE 7
                                ;*****************************************************************************
023404  005212                  TS242:      INC     (R2)            ;UPDATE TEST NUMBER
023406  022712  000242                      CMP     #242,(R2)       ;SEQUENCE ERROR?
023412  001024                              BNE     TS243-10        ;BR TO ERROR HALT ON SEQ ERROR
023414  012737  052652  000000              MOV     #52652,@#0      ;LOC. 0=52652
023422  012700  000410                      MOV     #410,R0         ;R0=410
023426  005037  177776                      CLR     @#PS            ;PS=0
023432  106470  177776                      MTPS    @-2(R0)         ;TRY MTPS W/MODE 7
023436  022737  000105  177776              CMP     #105,@#PS       ;CHECK DEST. DATA
023444  001404                              BEQ     MTPS7
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 762             <====
023446  012742  000554                      MOV     #554,-(R2)      ;MOVE TO MAILBOX #  *******  554  *******
023452  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023454  000000                              HALT                    ;DESTINATION DATA INCORRECT
023456  022700  000410          MTPS7:      CMP     #410,R0         ;CHECK MODE 7 REGISTER
023462  001404                              BEQ     TS243
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 753             <====
023464  012742  000555                      MOV     #555,-(R2)      ;MOVE TO MAILBOX #  *******  555  *******
023470  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023472  000000                              HALT                    ;MODE 7 REGISTER MODIFIED
                                                                    ;  OR SEQUENCE ERROR


                                ;*****************************************************************************
                                ;
                                ;       THESE NEXT SEVEN TESTS VERIFY THE MFPS INSTRUCTION IN ALL
                                ;MODES. IN EACH TEST, A PATTERN OF ONES AND ZEROES IS MOVED TO THE
                                ;PSW, AND AN MFPS INSTRUCTION MOVES THE DATA TO A LOCATION SETUP
                                ;BY R0, EITHER DIRECTLY OR INDIRECTLY. CONDITIONAL BRANCHES ARE
                                ;USED TO CHECK PROPER ADDRESSING AND DATA.
                                ;
                                ;*****************************************************************************
                                ;TEST 243         TEST MFPS INSTRUCTION
                                ;*****************************************************************************
```

```
023474  005212                          TS243:  INC     (R2)            ;UPDATE TEST NUMBER
023476  022712  000243                          CMP     #243,(R2)       ;SEQUENCE ERROR?
023502  001025                                  BNE     TS244-10        ;BR TO ERROR HALT ON SEQ ERROR
023504  012737  000377  177776                  MOV     #377,@#PS
023512  106700                                  MFPS    R0
023514  022700  177757                          CMP     #177757,R0
023520  001404                                  BEQ     MFPS1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 770            <====
023522  012742  000556                          MOV     #556,-(R2)      ;MOVE TO MAILBOX #  *******  556  *******
023526  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023530  000000                                  HALT                    ;MFPS FAILED

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

                                        ;***************************************************************************
                                        ;TEST 244               TEST MFPS MODE 2
                                        ;***************************************************************************
023566  005212                          TS244:  INC     (R2)            ;UPDATE TEST NUMBER
023570  022712  000244                          CMP     #244,(R2)       ;SEQUENCE ERROR?
023574  001031                                  BNE     TS245-10        ;BR TO ERROR HALT ON SEQ ERROR
023576  005000                                  CLR     R0              ;R0=0
023600  005010                                  CLR     (R0)            ;LOC. 0=0
023602  012737  000377  177776                  MOV     #377,@#PS       ;SET PS=357
023610  106720                                  MFPS    (R0)+           ;TRY MFPS W/MODE 2
023612  103003                                  BCC     MFPS2A          ;BR TO ERROR IF C BIT CLEAR
023614  102402                                  BVS     MFPS2A          ;BR TO ERROR IF V BIT SET
023616  001401                                  BEQ     MFPS2A          ;BR TO ERROR IF Z BIT SET
023620  100404                                  BMI     MFPS2B
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 765            <====
023622                                  MFPS2A:
023622  012742  000560                          MOV     #560,-(R2)      ;MOVE TO MAILBOX #  *******  560  *******
023626  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023630  000000                                  HALT                    ;COND. CODES INCORRECT
023632  022737  000357  000000          MFPS2B: CMP     #357,@#0        ;CHECK DEST. DATA
023640  001404                                  BEQ     MFPS2C
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
```

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

                                ;*****************************************************************************
                                ;TEST 245       TEST MFPS MODE 3
                                ;*****************************************************************************
023670  005212                  TS245:  INC     (R2)            ;UPDATE TEST NUMBER
023672  022712  000245                  CMP     #245,(R2)       ;SEQUENCE ERROR?
023676  001033                          BNE     TS246-10        ;BR TO ERROR HALT ON SEQ ERROR
023700  012700  000406                  MOV     #406,R0         ;R0=406
023704  005037  000000                  CLR     @#0             ;LOC. 0=0
023710  012737  000252  177776          MOV     #252,@#PS       ;PS=252
023716  106730                          MFPS    @(R0)+          ;TRY MFPS WITH MODE 3
023720  103403                          BCS     MFPS3A          ;BR TO ERROR IF C-BIT SET
023722  102402                          BVS     MFPS3A          ;BR TO ERROR IF V-BIT SET
023724  001401                          BEQ     MFPS3A          ;BR TO ERROR IF Z-BIT SET
023726  100404                          BMI     MFPS3B
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                                ;           CONDITIONAL BRANCH INST. AND         <====
                                                                ;           REPLACE THE MOVE INSTRUCTION         <====
                                                                ;           WHICH FOLLOWS W/ 763                 <====
023730                          MFPS3A:
023730  012742  000563                  MOV     #563,-(R2)      ;MOVE TO MAILBOX #  *******  563  *******
023734  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023736  000000                          HALT                    ;CONDITION CODES INCORRECT
023740  022737  125000  000000  MFPS3B: CMP     #125000,@#0     ;CHECK DEST. DATA
023746  001404                          BEQ     MFPS3C
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                                ;           CONDITIONAL BRANCH INST. AND         <====
                                                                ;           REPLACE THE MOVE INSTRUCTION         <====
                                                                ;           WHICH FOLLOWS W/ 753                 <====
023750  012742  000564                  MOV     #564,-(R2)      ;MOVE TO MAILBOX #  *******  564  *******
023754  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023756  000000                          HALT                    ;DEST DATA INCORRECT
023760  020027  000410          MFPS3C: CMP     R0,#410         ;CHECK MODE 3 REGISTER.
023764  001404                          BEQ     TS246
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS         <====
                                                                ;           CONDITIONAL BRANCH INST. AND         <====
                                                                ;           REPLACE THE MOVE INSTRUCTION         <====
                                                                ;           WHICH FOLLOWS W/ 744                 <====
023766  012742  000565                  MOV     #565,-(R2)      ;MOVE TO MAILBOX #  *******  565  *******
023772  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
023774  000000                          HALT                    ;MODE 3 REGISTER NOT INCREMENTED BY 2
```

```
                                                                        ;  OR SEQUENCE ERROR

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

                                         ;*************************************************************************
                                         ;TEST 247          TEST MFPS MODE 5
                                         ;*************************************************************************
024104  005212                           TS247:  INC     (R2)                   ;UPDATE TEST NUMBER
024106  022712  000247                           CMP     #247,(R2)              ;SEQUENCE ERROR?
024112  001033                                   BNE     TS250-10               ;BR TO ERROR HALT ON SEQ ERROR
024114  012700  000410                           MOV     #410,R0                ;R0=410
024120  012737  177777  000000                   MOV     #-1,@#0                ;LOC. 0=-1
024126  005037  177776                           CLR     @#PS                   ;PS=0
024132  106750                                   MFPS    @-(R0)                 ;TRY MFPS W/MODE 5
024134  103403                                   BCS     MFPS5A                 ;BR TO ERROR IF C-BIT SET
024136  102402                                   BVS     MFPS5A                 ;BR TO ERROR IF V-BIT SET
```

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024140  100401                              BMI     MFPS5A          ;BR TO ERROR IF N-BIT SET
024142  001404                              BEQ     MFPS5B
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 763            <====
024144                              MFPS5A:
024144  012742  000571                      MOV     #571,-(R2)      ;MOVE TO MAILBOX #  *******  571  *******
024150  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024152  000000                              HALT                    ;COND. CODES INCORRECT
024154  022737  000377  000000      MFPS5B: CMP     #377,@#0        ;CHECK DEST. DATA
024162  001404                              BEQ     MFPS5C
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 753            <====
024164  012742  000572                      MOV     #572,-(R2)      ;MOVE TO MAILBOX #  *******  572  *******
024170  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024172  000000                              HALT                    ;DEST DATA INCORRECT
024174  020027  000406              MFPS5C: CMP     R0,#406         ;CHECK MODE 5 REGISTER
024200  001404                              BEQ     TS250
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 744            <====
024202  012742  000573                      MOV     #573,-(R2)      ;MOVE TO MAILBOX #  *******  573  *******
024206  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024210  000000                              HALT                    ;MODE 5 REGISTER NOT DECREMENTED BY 2
                                                                    ;  OR SEQUENCE ERROR

                                    ;*******************************************************************************
                                    ;TEST 250           TEST MFPS MODE 6
                                    ;*******************************************************************************
024212  005212                      TS250:  INC     (R2)            ;UPDATE TEST NUMBER
024214  022712  000250                      CMP     #250,(R2)       ;SEQUENCE ERROR?
024220  001034                              BNE     TS251-10        ;BR TO ERROR HALT ON SEQ ERROR
024222  012700  000401                      MOV     #401,R0         ;R0=410
024226  005037  000000                      CLR     @#0             ;LOC. 0=0
024232  012737  000252  177776              MOV     #252,@#PS       ;PS=252
024240  106760  177377                      MFPS    -401(R0)        ;TRY MFPS W/MODE 6
024244  102403                              BVS     MFPS6A          ;BR TO ERROR IF V-BIT SET
024246  103402                              BCS     MFPS6A          ;BR TO ERROR IF C-BIT SET
024250  001401                              BEQ     MFPS6A          ;BR TO ERROR IF Z-BIT SET
024252  100404                              BMI     MFPS6B
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 762            <====
024254                              MFPS6A:
024254  012742  000574                      MOV     #574,-(R2)      ;MOVE TO MAILBOX #  *******  574  *******
024260  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024262  000000                              HALT                    ;COND. CODES INCORRECT
024264  022737  000252  000000      MFPS6B: CMP     #252,@#0        ;CHECK DEST. DATA
024272  001404                              BEQ     MFPS6C
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
```

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

                                ;*******************************************************************************
                                ;TEST 251       TEST MFPS MODE 7
                                ;*******************************************************************************
024322  005212                  TS251:  INC     (R2)        ;UPDATE TEST NUMBER
024324  022712  000251                  CMP     #251,(R2)   ;SEQUENCE ERROR?
024330  001034                          BNE     TS252-10    ;BR TO ERROR HALT ON SEQ ERROR
024332  012700  000777                  MOV     #777,R0     ;R0=777
024336  005037  000000                  CLR     @#0         ;LOC. 0=0
024342  012737  000125  177776          MOV     #125,@#PS   ;PS=125
024350  106770  177407                  MFPS    @-371(R0)   ;TRY MFPS W/MODE 7
024354  102403                          BVS     MFPS7A      ;BR TO ERROR IF V-BIT SET
024356  103002                          BCC     MFPS7A      ;BR TO ERROR IF C-BIT SET
024360  001401                          BEQ     MFPS7A      ;BR TO ERROR IF Z-BIT SET
024362  100004                          BPL     MFPS7B
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                            ;           CONDITIONAL BRANCH INST. AND        <====
                                                            ;           REPLACE THE MOVE INSTRUCTION        <====
                                                            ;           WHICH FOLLOWS W/ 762                <====
024364                          MFPS7A:
024364  012742  000577                  MOV     #577,-(R2)  ;MOVE TO MAILBOX #  *******  577  *******
024370  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
024372  000000                          HALT                ;CONDITION CODE INCORRECT
024374  022737  042400  000000  MFPS7B: CMP     #42400,@#0  ;CHECK DESTINATION DATA
024402  001404                          BEQ     MFPS7C
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                            ;           CONDITIONAL BRANCH INST. AND        <====
                                                            ;           REPLACE THE MOVE INSTRUCTION        <====
                                                            ;           WHICH FOLLOWS W/ 752                <====
024404  012742  000600                  MOV     #600,-(R2)  ;MOVE TO MAILBOX #  *******  600  *******
024410  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
024412  000000                          HALT                ;DEST. DATA INCORRECT
024414  022700  000777          MFPS7C: CMP     #777,R0     ;CHECK MODE 7 REGISTER
024420  001404                          BEQ     TS252
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                            ;           CONDITIONAL BRANCH INST. AND        <====
                                                            ;           REPLACE THE MOVE INSTRUCTION        <====
                                                            ;           WHICH FOLLOWS W/ 743                <====
024422  012742  000601                  MOV     #601,-(R2)  ;MOVE TO MAILBOX #  *******  601  *******
024426  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
024430  000000                          HALT                ;MODE 7 REGISTER MODIFIED
```

```
                                                                        ;  OR SEQUENCE ERROR

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

                                        ;*******************************************************************************
                                        ;
                                        ;       THE FOLLOWING TEST CHECKS THE INDEPENDENT FUNCTIONING OF BASIC
```

```
                                            ;DATA PATH COMPONENTS WITH USER MODE SET.
                                            ;
                                            ;*****************************************************************************
                                            ;TEST 253         TEST USER MODE R6 CAN HOLD A ONE IN EVERY POSITION
                                            ;*****************************************************************************
024472  005212                              TS253:  INC     (R2)              ;UPDATE TEST NUMBER
024474  022712  000253                              CMP     #253,(R2)         ;SEQUENCE ERROR?
024500  001022                                      BNE     TS254-10          ;BR TO ERROR HALT ON SEQ ERROR
024502  012767  000340  153266                      MOV     #340,PS           ;LOCK OUT INTERRUPTS WHILE PLAYING WITH R6
024510  052767  140000  153260                      BIS     #USRM,PS                  ;SET USER MODE
024516  012706  000001                              MOV     #1,R6                     ;SET BIT0
024522  000241                                      CLC                               ;CLEAR C-BIT
024524  006106                              USP1:   ROL     R6                        ;ROTATE 1 POSITION
024526  103376                                      BCC     USP1                      ;BR IF NOT ALL DONE
024530  001407                                      BEQ     USP1A                     ;BR IF NO BITS PICKED
024532  042767  140000  153236                      BIC     #USRM,PS                  ;CLEAR USER MODE
024540  012742  000603                              MOV     #603,-(R2)        ;MOVE TO MAILBOX #  *******  603  *******
024544  005242                                      INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
024546  000000                                      HALT                      ;USER MODE R6 PICKED A BIT
024550  042767  140000  153220      USP1A:  BIC     #USRM,PS                  ;CLEAR USER MODE



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

```
024666  022706  177777                  CMP     #-1,R6                  ;CHECK USER R6 NOT ADDR. FROM KERNEL MODE
024672  042767  140000  153076          BIC     #USRM,PS                ;CLEAR USER MODE
024700  001404                          BEQ     USP4                    ;BR IF NO ERROR
024702  012742  000606                  MOV     #606,-(R2)      ;MOVE TO MAILBOX #  *******  606  *******
024706  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
024710  000000                          HALT                    ;DUAL ADDRESSING ERROR OR SEQUENCE ERROR
024712  012706  001000          USP4:   MOV     #STBOT,R6               ;RESTORE SP USER
024716  042767  140000  153052          BIC     #USRM,PS                ;SET KERNEL MODE
024724  012706  001000                  MOV     #STBOT,R6               ;RESTORE SP KERNEL

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

                                ;*******************************************************************************
                                ;TEST 256               TEST MTPI WITH R6 IN MODE 0
                                ;*******************************************************************************
025034  005212                  TS256:  INC     (R2)            ;UPDATE TEST NUMBER
025036  022712  000256                  CMP     #256,(R2)       ;SEQUENCE ERROR?
025042  001035                          BNE     TS257-10        ;BR TO ERROR HALT ON SEQ ERROR
025044  012767  000340  152724          MOV     #340,PS                 ;SET KERNEL MODE AND LOCK OUT INTERRUPTS
025052  005006                          CLR     R6                      ;INITIALIZE KERNEL R6
025054  052767  140000  152714          BIS     #USRM,PS                ;SET USER MODE/PREVIOUS KERNEL
025062  012706  027324                  MOV     #USTBOT,R6              ;INITIALIZE USER STACK POINTER
025066  012746  001000                  MOV     #STBOT,-(R6)            ;SET UP TARGET DATA
025072  006606                          MTPI    R6                      ;TRY MODE 0 MTPI
025074  022767  140340  152674          CMP     #140340,PS              ;CHECK PSW
025102  001407                          BEQ     MTPI0                   ;BR IF NO ERROR
025104  042767  140000  152664          BIC     #USRM,PS                ;CLEAR USER MODE
025112  012742  000611                  MOV     #611,-(R2)      ;MOVE TO MAILBOX #  *******  611  *******
025116  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
```

```
025120 000000                          HALT                     ;PS INCORRECT FOLLOWING MTPI
025122 042767 140000 152646   MTPI0:   BIC     #USRM,PS                 ;SET KERNEL MODE
025130 020627 001000                   CMP     R6,#STBOT                ;CHECK TARGET DATA
025134 001404                          BEQ     TS257
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 742             <====
025136 012742 000612                   MOV     #612,-(R2)       ;MOVE TO MAILBOX #  *******  612  *******
025142 005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
025144 000000                          HALT                     ;DATA INCORRECT FOLLOWING MTPI
                                                                ;  OR SEQUENCE ERROR



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

```
025244  012767  025340  000042              MOV     #CONT,NBR       ;SET TO CONTINUE IF NO BRANCH
025252  012767  025322  000040              MOV     #ER,YBR         ;SET TO REPORT ERROR IF BRANCH
025260  000167  000014                      JMP     AROUN           ;GO AROUND OPPOSITE CONDITION
025264  012767  025322  000022      SET2BR: MOV     #ER,NBR         ;SET TO REPORT ERROR IF NO BRANCH
025272  012767  025340  000020              MOV     #CONT,YBR       ;SET TO CONTINUE IF BRANCH
025300  006101                      AROUN:  ROL     R1              ;UPDATE BIT MAP

025302  012737                              MOV     (PC)+,@(PC)+    ;SET CONDITION CODE
025304  000000                      CC1:    0                       ;NEW CC VALUE GOES HERE
025306  177776                              177776
025310  000000                      BRH:    0                       ;BRANCH INST. GOES HERE
025312  000137                              JMP     @(PC)+          ;THIS JUMP IF NO BRANCH
025314  000000                      NBR:    0                       ;WHERE TO GO IF NO BRANCH OCCURS
025316  000137                              JMP     @(PC)+          ;THIS JUMP IF BRANCH OCCURS
025320  000000                      YBR:    0                       ;WHERE TO GO IF BRANCH OCCURS
025322  012702  000304              ER:     MOV     #$TESTN,R2      ;RESTORE POINTER
025326  012742  000613                      MOV     #613,-(R2)      ;MOVE TO MAILBOX #  *******  613  *******
025332  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025334  000000                              HALT                    ;
025336  000000                      BRCT:   0
025340  005303                      CONT:   DEC     R3              ;CC'S DONE?
025342  013705  177776                      MOV     @#177776,R5     ;SIMULATE A JNE
025346  042705  177773                      BIC     #177773,R5      ;       (JUMP NOT EQUAL)
025352  000165  025356                      JMP     .+4(R5)         ;       TO SETCC
025356  000167  177632                      JMP     SETCC
025362  005367  177750                      DEC     BRCT            ;BR'S DONE?
025366  013705  177776                      MOV     @#177776,R5     ;SIMULATE A JNE
025372  042705  177773                      BIC     #177773,R5      ;       (JUMP NOT EQUAL)
025376  000165  025402                      JMP     .+4(R5)         ;       TO SETBR
025402  000167  177566                      JMP     SETBR



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


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

                                 ;*******************************************************************************
                                 ;
                                 ;       THIS TEST VERIFIES THAT A JMP INSTRUCTION DOES NOT ALTER THE
                                 ;CONDITION CODES IN THE PSW. THE CC'S ARE PRESET,THE JMP IS
                                 ;EXECUTED, AND CONDITIONAL BRANCHES VERIFY THE STATE OF THE CC'S.
                                 ;
```

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

                                        ;*******************************************************************************
                                        ;
                                        ;       THIS TEST VERIFIES THE SET AND CLEAR CONDITION CODE INSTRUCTIONS.
                                        ;THE TEST CONSISTS OF TWO ROUTINES, ONE TO TEST ALL CLEAR CC
                                        ;INSTRUCTIONS, AND THE SECOND TO TEST ALL SET CC INSTRUCTIONS. ALL
                                        ;POSSIBLE COMBINATIONS OF CONDITION CODES ARE TESTED, INCLUDING NOP'S.
                                        ;       TO TEST THE CLEAR CC INSTRUCTIONS, ALL CONDITION CODES ARE
                                        ;INITIALLY SET. THE INSTRUCTION IS EXECUTED, AND THE PSW IS CHECKED
                                        ;TO VERIFY THE PROPER COMBINATION OF CONDITION CODES.
                                        ;       TO TEST THE SET CC INSTRUCTIONS, THE CONDITION CODES ARE
                                        ;INITIALLY CLEARED, AND ONLY THE REQUIRED BITS ARE SET BY THE SET CC
                                        ;INSTRUCTION. THE CONTENTS OF THE PSW ARE CHECKED TO VERIFY THAT
                                        ;ONLY THE REQUIRED BITS WERE SET.
                                        ;
                                        ;*******************************************************************************
                                        ;TEST 263        TEST SET CC AND CLEAR CC INSTRUCTIONS
                                        ;*******************************************************************************
025670  005212                          TS263:  INC     (R2)                    ;UPDATE TEST NUMBER
025672  022712  000263                          CMP     #263,(R2)               ;SEQUENCE ERROR?
025676  001062                                  BNE     CCERR                   ;BR TO ERROR HALT ON SEQ ERROR
025700  012767  000240  000024                  MOV     #240,CC3                ;INITIALIZE CLR CC INSTRUCTION CODES
025706  012767  000017  000032                  MOV     #17,CC2                 ;INITIALIZE OCTAL MAP
025714  012767  000261  000102                  MOV     #261,SC3                ;INITIALIZE SET CC INSTRUCTION CODES
025722  012767  000001  000110                  MOV     #1,SC4                  ;INITIALIZE OCTAL MAP
025730  000277                          CLRCD:  SCC                             ;SET ALL CONDITION CODES
025732  000000                          CC3:    0                               ;CONDITION CODE INSTRUCTION
025734  013704  177776                          MOV     @#PS,R4                 ;COPY THE PSW
025740  042704  177760                          BIC     #177760,R4              ;ISOLATE CONDITION CODES
025744  022704                                  CMP     (PC)+,R4                ;CHECK THAT PROPER CC'S WERE CLEARED
025746  000000                          CC2:    0                               ;OCTAL REPRESENTATION OF CC'S
025750  001404                                  BEQ     CON1
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                                ;           CONDITIONAL BRANCH INST. AND    <====
```

```
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 752            <====
025752  012742  000617                  MOV     #617,-(R2)      ;MOVE TO MAILBOX #  *******  617  *******
025756  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
025760  000000                          HALT                    ;CLEAR CC INSTRUCTION FAILED
025762  005367  177760          CON1:   DEC     CC2             ;SET NEXT OCTAL MAP OF CC'S
025766  005267  177740                  INC     CC3             ;GET NEXT CLEAR CC INSTRUCTION
025772  026727  177734  000257          CMP     CC3,#257        ;TEST FOR CCC INSTRUCTION
026000  003753                          BLE     CLRCD           ;GO TEST NEXT INSTRUCTION IF NOT FOUND
026002  026727  177724  000260          CMP     CC3,#260        ;CHECK FOR NOP=260
026010  001004                          BNE     SETCD           ;GO TEST SET CC INSTRUCTIONS
026012  012767  000017  177726          MOV     #17,CC2         ;SET OCTAL MAP TO TEST NOP
026020  000743                          BR      CLRCD           ;GO TEST NOP
026022  000257                  SETCD:  CCC                     ;CLEAR ALL CONDITION CODES
026024  000000                  SC3:    0                       ;CONDITION CODE INSTRUCTION
026026  013704  177776                  MOV     @#PS,R4         ;COY PSW
026032  042704  177760                  BIC     #177760,R4      ;CLEAR AWAY UNWANTED BITS
026036  022704                          CMP     (PC)+,R4        ;CHECK THAT PROPER CC'S WERE SET
026040  000000                  SC4:    0                       ;OCTAL REPRESENTATION OF CC'S
026042  001404                          BEQ     CON2
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                        ;           CONDITIONAL BRANCH INST. AND        <====
                                                        ;           REPLACE THE MOVE INSTRUCTION        <====
                                                        ;           WHICH FOLLOWS W/ 715                <====
026044                          CCERR:
026044  012742  000620                  MOV     #620,-(R2)      ;MOVE TO MAILBOX #  *******  620  *******
026050  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
026052  000000                          HALT                    ;SET CC FAILED OR SEQUENCE ERROR
026054  005267  177760          CON2:   INC     SC4             ;SET NEXT OCTAL MAP
026060  005267  177740                  INC     SC3             ;PREPARE NEXT SET CC INSTRUCTION
026064  026727  177734  000277          CMP     SC3,#277        ;FINISHED?
026072  003753                          BLE     SETCD           ;BR IF NO
026074  000167  000006                  JMP     MOR0            ;JUMP TO NEXT TESTS
```

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

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

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

```
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                              ;           WHICH FOLLOWS W/ 742            <====
026350  012742  000627                  MOV     #627,-(R2)    ;MOVE TO MAILBOX #  *******  627  *******
026354  005242                          INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
026356  000000                          HALT                  ;LOC A STORES WRONG DATA

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

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

026450  022737  026102  026100  MOR6:   CMP     #A+2,@#A      ;CHECK CONTENT OF R0 WAS DECR BY 2 BEFORE
                                                              ;BEING USED IN THE ''ADD'' INSTR
026456  001404                          BEQ     MOR7
                                                              ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                              ;           CONDITIONAL BRANCH INST. AND    <====
                                                              ;           REPLACE THE MOVE INSTRUCTION    <====
                                                              ;           WHICH FOLLOWS W/ 752            <====
026460  012742  000632                  MOV     #632,-(R2)    ;MOVE TO MAILBOX #  *******  632  *******
026464  005242                          INC     -(R2)         ;SET MSGTYP TO FATAL ERROR
026466  000000                          HALT                  ;LOC A STORES WRONG DATA

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

027324                          TO4:
027324  012742  000646                  MOV     #646,-(R2)              ;MOVE TO MAILBOX #  *******  646  *******
027330  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
027332  000000                          HALT                            ;TRAPPED THRU LOC. 4
027334                          TO10:
027334  012742  000647                  MOV     #647,-(R2)              ;MOVE TO MAILBOX #  *******  647  *******
027340  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
027342  000000                          HALT                            ;TRAPPED THRU LOC. 10
027344                          TO14:
027344  012742  000650                  MOV     #650,-(R2)              ;MOVE TO MAILBOX #  *******  650  *******
027350  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
```

```
8604 027352 000000                  HALT                    ;TRAPPED THRU LOC. 14
8605 027354                 T030:
8606 027354 012742 000651           MOV     #651,-(R2)      ;MOVE TO MAILBOX #  *******  651  *******
8607 027360 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
8608 027362 000000                  HALT                    ;TRAPPED THRU LOC. 30
8609 027364                 T034:
8610 027364 012742 000652           MOV     #652,-(R2)      ;MOVE TO MAILBOX #  *******  652  *******
8611 027370 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
8612 027372 000000                  HALT                    ;TRAPPED THRU LOC. 34
8613 027374                 T0114:
8614 027374 012742 000653           MOV     #653,-(R2)      ;MOVE TO MAILBOX #  *******  653  *******
8615 027400 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
8616 027402 000000                  HALT                    ;TRAPPED THRU LOC. 114
8617 027404                 T0244:
8618 027404 012742 000654           MOV     #654,-(R2)      ;MOVE TO MAILBOX #  *******  654  *******
8619 027410 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
8620 027412 000000                  HALT                    ;TRAPPED THRU LOC. 244
8621 027414                 T0250:
8622 027414 012742 000655           MOV     #655,-(R2)      ;MOVE TO MAILBOX #  *******  655  *******
8623 027420 005242                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
8624 027422 000000                  HALT                    ;TRAPPED THRU LOC. 250
8625                        .SBTTL ** STARTING OF TRAP TEST **
8626 027424                 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

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

027456   032737   000001   000320      TESTN1: BIT     #1,@#$ENV       ;ARE WE RUNNING IN APT MODE
027464   001403                                 BEQ     1$              ;IF NO USE SOFTWARE SWITCH REGISTER
027466   012767   000322   177760               MOV     #$SWREG,SWR     ;IF YES USE APT SWITCH REGISTER
027474   032777   000001   177752      1$:      BIT     #1,@SWR         ;IF BIT IS NON-ZERO SHIP ALL TRAPS TESTS
027502   001402                                 BEQ     2$
027504   000167   012722                        JMP     THRPRT
027510                                 2$:
                                       ;*******************************************************************************
                                       ;TEST 300        TEST AUTO INCREMENT AND DECREMENT OF R6 FOR WORD AND BYTES
                                       ;*******************************************************************************
027510   005212                         TS300:  INC     (R2)            ;UPDATE TEST NUMBER
027512   022712   000300                        CMP     #300,(R2)       ;SEQUENCE ERROR?
027516   001127                                 BNE     TS301-10        ;BR TO ERROR HALT ON SEQ ERROR
027520   005006                                 CLR     %6
027522   112667   150252                        MOVB    (6)+,HERE       ;SIX SHOULD INCREMENT BY TWO
027526   020627   000002                        CMP     %6,#2
027532   001404                                 BEQ     BR1
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 771            <====
027534   012742   000656                        MOV     #656,-(R2)      ;MOVE TO MAILBOX #  *******  656  *******
027540   005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027542   000000                                 HALT                    ;R6 DID NOT AUTO INCREMENT BY TWO

027544   012706   001000               BR1:     MOV     #1000,%6
027550   114627   000000                        MOVB    -(6),#HERE      ;SHOULD DECREMENT BY TWO
027554   020627   000776                        CMP     %6,#776
027560   001404                                 BEQ     BR2
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 756            <====
027562   012742   000657                        MOV     #657,-(R2)      ;MOVE TO MAILBOX #  *******  657  *******
027566   005242                                 INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027570   000000                                 HALT                    ;R6 DID NOT AUTO DECREMENT BY 2

027572   005006                         BR2:    CLR     %6
027574   112626                                 MOVB    (6)+,(6)+       ;DOUBLES AUTO INCREMENT OF R6
```

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027576  020627  000004              CMP     %6,#4
027602  001404                      BEQ     BR3
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 745             <====
027604  012742  000660              MOV     #660,-(R2)      ;MOVE TO MAILBOX #  *******  660  *******
027610  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027612  000000                      HALT                    ;WRONG AUTO INCREMENT OF R6

027614  005006              BR3:    CLR     %6
027616  005004                      CLR     %4
027620  122624                      CMPB    (6)+,(4)+       ;TEST INCREMENT OF R6
027622  020627  000002              CMP     %6,#2
027626  001404                      BEQ     BR4
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 733             <====
027630  012742  000661              MOV     #661,-(R2)      ;MOVE TO MAILBOX #  *******  661  *******
027634  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027636  000000                      HALT                    ;WRONG INCREMENT OF R6

027640  005006              BR4:    CLR     %6
027642  005004                      CLR     %4
027644  122426                      CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
027646  020627  000002              CMP     %6,#2
027652  001404                      BEQ     BR5
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 721             <====
027654  012742  000662              MOV     #662,-(R2)      ;MOVE TO MAILBOX #  *******  662  *******
027660  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027662  000000                      HALT                    ;WRONG INCREMENT OF R6

027664  005006              BR5:    CLR     %6
027666  005004                      CLR     %4
027670  122624                      CMPB    (6)+,(4)+       ;TEST INCREMENT OF R4
027672  020427  000001              CMP     %4,#1
027676  001404                      BEQ     BR6
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
                                                            ;           WHICH FOLLOWS W/ 707             <====
027700  012742  000663              MOV     #663,-(R2)      ;MOVE TO MAILBOX #  *******  663  *******
027704  005242                      INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
027706  000000                      HALT                    ;WRONG INCREMENT OF R4
027710  005006              BR6:    CLR     %6
027712  005004                      CLR     %4
027714  122426                      CMPB    (4)+,(6)+       ;TEST INCREMENT OF R6
027716  020627  000002              CMP     %6,#2
027722  001404                      BEQ     BR7
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                            ;           CONDITIONAL BRANCH INST. AND     <====
                                                            ;           REPLACE THE MOVE INSTRUCTION     <====
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                                                        ;               WHICH FOLLOWS W/ 675           <====
027724  012742  000664                 MOV     #664,-(R2)       ;MOVE TO MAILBOX #  *******  664  *******
027730  005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
027732  000000                         HALT                     ;WRONG INCREMENT OF R6

027734  005006                 BR7:    CLR     %6
027736  005004                         CLR     %4
027740  122426                         CMPB    (4)+,(6)+        ;TEST INCREMENT OF R4
027742  020427  000001                 CMP     %4,#1
027746  001404                         BEQ     BR10
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                        ;           CONDITIONAL BRANCH INST. AND        <====
                                                        ;           REPLACE THE MOVE INSTRUCTION        <====
                                                        ;           WHICH FOLLOWS W/ 663                <====
027750  012742  000665                 MOV     #665,-(R2)       ;MOVE TO MAILBOX #  *******  665  *******
027754  005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
027756  000000                         HALT                     ;WRONG INCREMENT OF R4

027760  012706  001000         BR10:   MOV     #1000,%6
027764  124627  000000                 CMPB    -(6),#HERE       ;TEST DECREMENT OF R6
027770  022706  000776                 CMP     #776,%6
027774  001404                         BEQ     TS301
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                        ;           CONDITIONAL BRANCH INST. AND        <====
                                                        ;           REPLACE THE MOVE INSTRUCTION        <====
                                                        ;           WHICH FOLLOWS W/ 650                <====
027776  012742  000666                 MOV     #666,-(R2)       ;MOVE TO MAILBOX #  *******  666  *******
030002  005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
030004  000000                         HALT                     ;WRONG DECREMENT OF R6,OR WRONG $TSTNM
                                                        ;  OR SEQUENCE ERROR
                               ;*****************************************************************************
                               ;TEST 301        TEST TRANSFER OF .BYTE USING R6
                               ;*****************************************************************************
030006  005212                 TS301:  INC     (R2)             ;UPDATE TEST NUMBER
030010  022712  000301                 CMP     #301,(R2)        ;SEQUENCE ERROR?
030014  001133                         BNE     TS302-10         ;BR TO ERROR HALT ON SEQ ERROR
030016  012767  123456  177414         MOV     #123456,K5
030024  012767  050505  177376         MOV     #050505,K1
030032  012705  027430                 MOV     #K1,%5           ;%5=(050505)K1
030036  012706  027440                 MOV     #K5,%6           ;%6=(123456)K5
030042  112625                         MOVB    (6)+,(5)+        ;LOW .BYTE OF R6 TO R5
030044  022767  050456  177356         CMP     #050456,K1
030052  001404                         BEQ     BR11
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                        ;           CONDITIONAL BRANCH INST. AND        <====
                                                        ;           REPLACE THE MOVE INSTRUCTION        <====
                                                        ;           WHICH FOLLOWS W/ 760                <====
030054  012742  000667                 MOV     #667,-(R2)       ;MOVE TO MAILBOX #  *******  667  *******
030060  005242                         INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
030062  000000                         HALT                     ;FALSE TRANSFER OF .BYTE

030064  012767  123456  177346 BR11:   MOV     #123456,K5
030072  012767  050505  177330         MOV     #050505,K1
030100  012705  027430                 MOV     #K1,%5           ;%5(050505)K1
030104  012706  027442                 MOV     #K6,%6           ;%6(123456)K5
030110  114625                         MOVB    -(6),(5)+        ;LOW .BYTE OF R6 TO R5 (DECREMENT)
```

```
030112 026727 177312 050456              CMP     K1,#050456
030120 001404                            BEQ     BR12
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 735             <====
030122 012742 000670                     MOV     #670,-(R2)      ;MOVE TO MAILBOX # ******* 670 *******
030126 005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030130 000000                            HALT                    ;FALSE R6 .BYTE TRANSFER

030132 012767 123456 177270      BR12:   MOV     #123456,K1
030140 012767 050505 177272              MOV     #050505,K5
030146 012705 027430                     MOV     #K1,%5          ;(123456)
030152 012706 027440                     MOV     #K5,%6          ;(050505)
030156 112526                            MOVB    (5)+,(6)+       ;LOW OF R5 TO LOW OF R6
030160 022767 050456 177252              CMP     #050456,K5
030166 001404                            BEQ     BR13
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 712             <====
030170 012742 000671                     MOV     #671,-(R2)      ;MOVE TO MAILBOX # ******* 671 *******
030174 005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030176 000000                            HALT                    ;FALSE R6 .BYTE TRANSFER

030200 012767 123456 177222      BR13:   MOV     #123456,K1
030206 012767 050505 177224              MOV     #050505,K5
030214 012705 027431                     MOV     #K1+1,%5        ;123456
030220 012706 027440                     MOV     #K5,%6          ;050505
030224 112526                            MOVB    (5)+,(6)+       ;HIGH OF R5 TO LOW OF R6
030226 026727 177206 050647              CMP     K5,#050647
030234 001404                            BEQ     BR14
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 667             <====
030236 012742 000672                     MOV     #672,-(R2)      ;MOVE TO MAILBOX # ******* 672 *******
030242 005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030244 000000                            HALT                    ;FALSE R6 .BYTE TRANSFER

030246 012767 123456 177154      BR14:   MOV     #123456,K1
030254 012767 050505 177156              MOV     #050505,K5
030262 012705 027431                     MOV     #K1+1,%5        ;R5-123456-ODD ADDRESS
030266 012706 027440                     MOV     #K5,%6          ;R6-050505--.EVEN ADDRESS
030272 112625                            MOVB    (6)+,(5)+       ;LOW OF R6 TO HIGH OF R5
030274 022767 042456 177126              CMP     #042456,K1
030302 001404                            BEQ     TS302
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 644             <====
030304 012742 000673                     MOV     #673,-(R2)      ;MOVE TO MAILBOX # ******* 673 *******
030310 005242                            INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030312 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
                                        ;*******************************************************************************
030314  005212                          TS302:  INC     (R2)            ;UPDATE TEST NUMBER
030316  022712  000302                          CMP     #302,(R2)       ;SEQUENCE ERROR?
030322  001074                                  BNE     TS303-10        ;BR TO ERROR HALT ON SEQ ERROR
030324  126767  177114  177113                  CMPB    K7,K7+1         ;SAME .WORD LOW TO HIGH
030332  001404                                  BEQ     BR15
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 773              <====
030334  012742  000674                          MOV     #674,-(R2)      ;MOVE TO MAILBOX #  *******  674  *******
030340  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030342  000000                                  HALT                    ;SHOULD COMPARE LOW TO HIGH

030344  126767  177075  177072  BR15:           CMPB    K7+1,K7         ;COMPARE ODD TO .EVEN SAME .WORD
030352  001404                                  BEQ     BR16
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 763              <====
030354  012742  000675                          MOV     #675,-(R2)      ;MOVE TO MAILBOX #  *******  675  *******
030360  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030362  000000                                  HALT                    ;ODD TO .EVEN .BYTE FAILURE

030364  126767  177057  177052  BR16:           CMPB    K10+1,K7        ;SEQUENTIAL .BYTES
030372  001404                                  BEQ     BR17
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 753              <====
030374  012742  000676                          MOV     #676,-(R2)      ;MOVE TO MAILBOX #  *******  676  *******
030400  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030402  000000                                  HALT                    ;ODD TO .EVEN FAILED

030404  126767  177036  177030  BR17:           CMPB    K10,K6
030412  001404                                  BEQ     BR20
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 743              <====
030414  012742  000677                          MOV     #677,-(R2)      ;MOVE TO MAILBOX #  *******  677  *******
030420  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030422  000000                                  HALT                    ;.EVEN TO EVEN FAILED
030424  126767  177015  177015  BR20:           CMPB    K7+1,K10+1
030432  001404                                  BEQ     BR21
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 733              <====
030434  012742  000700                          MOV     #700,-(R2)      ;MOVE TO MAILBOX #  *******  700  *******
030440  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030442  000000                                  HALT                    ;ODD TO ODD FAILED

030444  126767  176776  176775  BR21:           CMPB    K10,K10+1
030452  001004                                  BNE     BR22
```

```
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 723            <====
030454  012742  000701                  MOV     #701,-(R2)  ;MOVE TO MAILBOX #  *******  701  *******
030460  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
030462  000000                          HALT                ;LOW TO HIGH IN SAME .WORD FAILED

030464  126767  176757  176755  BR22:   CMPB    K10+1,K10+1
030472  001404                          BEQ     BR23
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 713            <====
030474  012742  000702                  MOV     #702,-(R2)  ;MOVE TO MAILBOX #  *******  702  *******
030500  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
030502  000000                          HALT                ;HIGH TO LOW IN SAME .WORD FAILED

030504  126767  176736  176733  BR23:   CMPB    K10,K7+1
030512  001004                          BNE     TS303
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 703            <====
030514  012742  000703                  MOV     #703,-(R2)  ;MOVE TO MAILBOX #  *******  703  *******
030520  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
030522  000000                          HALT                ;.EVEN TO ODD FAILED,OR WRONG $TSTNM
                                                            ;  OR SEQUENCE ERROR


                                ;*************************************************************************
                                ;TEST 303               TEST THE CC BITS
                                ;*************************************************************************
030524  005212                  TS303:  INC     (R2)        ;UPDATE TEST NUMBER
030526  022712  000303                  CMP     #303,(R2)   ;SEQUENCE ERROR?
030532  001053                          BNE     TS304-10    ;BR TO ERROR HALT ON SEQ ERROR
030534  000277                          SCC                 ;SET STATUS
030536  005067  147234                  CLR     STATUS      ;CLEAR STATUS
030542  103004                          BCC     BR33
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 773            <====
030544  012742  000704                  MOV     #704,-(R2)  ;MOVE TO MAILBOX #  *******  704  *******
030550  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
030552  000000                          HALT                ;C NOT CLEAR
030554                          BR33:
030554  102004                          BVC     BR34
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;           CONDITIONAL BRANCH INST. AND    <====
                                                            ;           REPLACE THE MOVE INSTRUCTION    <====
                                                            ;           WHICH FOLLOWS W/ 766            <====
030556  012742  000705                  MOV     #705,-(R2)  ;MOVE TO MAILBOX #  *******  705  *******
030562  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
030564  000000                          HALT                ;V NOT CLEAR
030566                          BR34:
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030566  001004                          BNE     BR35
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 761              <====
030570  012742  000706                  MOV     #706,-(R2)      ;MOVE TO MAILBOX #  *******  706  *******
030574  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030576  000000                          HALT                    ;Z NOT CLEAR
030600                          BR35:
030600  100004                          BPL     BR36
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 754              <====
030602  012742  000707                  MOV     #707,-(R2)      ;MOVE TO MAILBOX #  *******  707  *******
030606  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030610  000000                          HALT                    ;N NOT CLEAR
030612  000257                  BR36:   CCC                     ;CLEAR CONDITION CODES
030614  052767  000017  147154          BIS     #17,STATUS      ;SET STATUS TO ONES

030622  103404                          BCS     BR37
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 743              <====
030624  012742  000710                  MOV     #710,-(R2)      ;MOVE TO MAILBOX #  *******  710  *******
030630  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030632  000000                          HALT                    ;C NOT SET
030634                          BR37:
030634  102404                          BVS     BR40
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 736              <====
030636  012742  000711                  MOV     #711,-(R2)      ;MOVE TO MAILBOX #  *******  711  *******
030642  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030644  000000                          HALT                    ;V NOT SET
030646                          BR40:
030646  001404                          BEQ     BR41
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 731              <====
030650  012742  000712                  MOV     #712,-(R2)      ;MOVE TO MAILBOX #  *******  712  *******
030654  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030656  000000                          HALT                    ;Z NOT SET
030660                          BR41:
030660  100404                          BMI     TS304
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 724              <====
030662  012742  000713                  MOV     #713,-(R2)      ;MOVE TO MAILBOX #  *******  713  *******
030666  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030670  000000                          HALT                    ;N NOT SET,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
```

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                                    ;*****************************************************************************
                                    ;TEST 304        TEST THAT A TRAP OCCURS ON A RESERVED INSTRUCTION
                                    ;*****************************************************************************
030672  005212                      TS304:  INC     (R2)            ;UPDATE TEST NUMBER
030674  022712  000304                      CMP     #304,(R2)       ;SEQUENCE ERROR?
030700  001006                              BNE     RETA            ;BR TO ERROR HALT ON SEQ ERROR
030702  012706  001000                      MOV     #BUFF,SP        ;STACK POINTER SETUP
030706  012767  030726  147074              MOV     #RETAH,RTRAP    ;RETURN LOCATION
030714  000077                              TRAPA                   ;RESERVED INSTRUCTION, SHOULD TRAP
030716                              RETA:
030716  012742  000714                      MOV     #714,-(R2)      ;MOVE TO MAILBOX #  *******  714  *******
030722  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030724  000000                              HALT                    ;RESERVE INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
030726                              RETAH:
                                    ;*****************************************************************************
                                    ;TEST 305        TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                    ;*****************************************************************************
030726  005212                      TS305:  INC     (R2)            ;UPDATE TEST NUMBER
030730  022712  000305                      CMP     #305,(R2)       ;SEQUENCE ERROR?
030734  001011                              BNE     TS306-10        ;BR TO ERROR HALT ON SEQ ERROR
030736  012706  001000                      MOV     #BUFF,SP        ;STACK POINTER SETUP
030742  012767  030752  147040              MOV     #RETB,RTRAP     ;RETURN POINTER
030750  000077                              TRAPA                   ;RESERVED INSTRUCTION
030752  020627  000774              RETB:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
030756  001404                              BEQ     TS306
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 766            <====
030760  012742  000715                      MOV     #715,-(R2)      ;MOVE TO MAILBOX #  *******  715  *******
030764  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
030766  000000                              HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                    ;  OR SEQUENCE ERROR
                                    ;*****************************************************************************
                                    ;TEST 306        TEST THAT PROPER P.C. IS SAVED
                                    ;*****************************************************************************
030770  005212                      TS306:  INC     (R2)            ;UPDATE TEST NUMBER
030772  022712  000306                      CMP     #306,(R2)       ;SEQUENCE ERROR?
030776  001012                              BNE     TS307-10        ;BR TO ERROR HALT ON SEQ ERROR
031000  012706  001000                      MOV     #BUFF,SP        ;STACK POINTER SETUP
031004  012767  031014  146776              MOV     #RETC,RTRAP     ;RETURN FROM TRAP POINTER
031012  000077                      INSTC:  TRAPA                   ;TRAP ON THIS INSTRUCTION
031014  022767  031014  147752      RETC:   CMP     #.,BUFF-4       ;CHECK FOR INCREMENTED P.C.
031022  001404                              BEQ     TS307
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                    ;           CONDITIONAL BRANCH INST. AND    <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                    ;           WHICH FOLLOWS W/ 765            <====
031024  012742  000716                      MOV     #716,-(R2)      ;MOVE TO MAILBOX #  *******  716  *******
031030  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031032  000000                              HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                    ;  OR SEQUENCE ERROR
                                    ;*****************************************************************************
                                    ;TEST 307        TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                    ;*****************************************************************************
031034  005212                      TS307:  INC     (R2)            ;UPDATE TEST NUMBER
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9124 031036 022712 000307                  CMP     #307,(R2)         ;SEQUENCE ERROR?
9125 031042 001037                         BNE     TS310-10          ;BR TO ERROR HALT ON SEQ ERROR
9126 031044 012706 001000                  MOV     #BUFF,SP          ;SET UP
9127 031050 012767 031066 146732           MOV     #RETD,RTRAP       ;SET UP
9128 031056 005067 146714                  CLR     CC                ;CLEAR CC AND PRIORITY
9129 031062 000257                         CCC
9130 031064 000077                         TRAPA                     ;TRAP
9131 031066 026727 147704 000000   RETD:   CMP     BUFF-2,#0         ;TEST THAT OLD STATUS WENT TO STACK
9132 031074 001404                         BEQ     1$
9133                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
9134                                                                 ;           CONDITIONAL BRANCH INST. AND      <====
9135                                                                 ;           REPLACE THE MOVE INSTRUCTION      <====
9136                                                                 ;           WHICH FOLLOWS W/ 762              <====
9137 031076 012742 000717                  MOV     #717,-(R2)        ;MOVE TO MAILBOX #  *******  717  *******
9138 031102 005242                         INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
9139 031104 000000                         HALT                      ;INCORRECT STATUS
9140 031106 012706 001000          1$:     MOV     #BUFF,SP          ;SET UP
9141 031112 012767 031132 146670           MOV     #RETE,RTRAP       ;SET UP
9142 031120 012767 000357 146650           MOV     #357,CC           ;SET PRIORITY
9143 031126 000277                         SCC                       ;SET CC
9144 031130 000077                         TRAPA                     ;TRAP
9145 031132 026727 147640 000357   RETE:   CMP     BUFF-2,#357       ;COMPARES STATUS ON STACK
9146 031140 001404                         BEQ     TS310
9147                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
9148                                                                 ;           CONDITIONAL BRANCH INST. AND      <====
9149                                                                 ;           REPLACE THE MOVE INSTRUCTION      <====
9150                                                                 ;           WHICH FOLLOWS W/ 740              <====
9151 031142 012742 000720                  MOV     #720,-(R2)        ;MOVE TO MAILBOX #  *******  720  *******
9152 031146 005242                         INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
9153 031150 000000                         HALT                      ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
9154                                                                 ;  OR SEQUENCE ERROR
9155                               ;*******************************************************************************
9156                               ;TEST 310        TEST THAT "NEW" STATUS IS CORRECT
9157                               ;*******************************************************************************
9158 031152 005212                 TS310:  INC     (R2)              ;UPDATE TEST NUMBER
9159 031154 022712 000310                  CMP     #310,(R2)         ;SEQUENCE ERROR?
9160 031160 001110                         BNE     STPP              ;BR TO ERROR HALT ON SEQ ERROR
9161 031162 012706 001000                  MOV     #BUFF,SP
9162 031166 012767 031202 146614           MOV     #RETF,RTRAP
9163 031174 005067 146612                  CLR     RTRAP+2           ;CLEAR FUTURE PRIORITY AND CC
9164 031200 000077                         TRAPA
9165 031202                        RETF:                             ;TEST FOR "C" CLEARED
9166 031202 100004                         BPL     1$
9167                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
9168                                                                 ;           CONDITIONAL BRANCH INST. AND      <====
9169                                                                 ;           REPLACE THE MOVE INSTRUCTION      <====
9170                                                                 ;           WHICH FOLLOWS W/ 766              <====
9171 031204 012742 000721                  MOV     #721,-(R2)        ;MOVE TO MAILBOX #  *******  721  *******
9172 031210 005242                         INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
9173 031212 000000                         HALT                      ;N NOT CLEARED
9174 031214                        1$:
9175 031214 001004                         BNE     2$
9176                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
9177                                                                 ;           CONDITIONAL BRANCH INST. AND      <====
9178                                                                 ;           REPLACE THE MOVE INSTRUCTION      <====
9179                                                                 ;           WHICH FOLLOWS W/ 761              <====
```

```
031216  012742  000722                          MOV     #722,-(R2)      ;MOVE TO MAILBOX #  *******  722  *******
031222  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031224  000000                                  HALT                    ;Z NOT CLEARED
031226                                  2$:
031226  102004                                  BVC     3$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 754              <====
031230  012742  000723                          MOV     #723,-(R2)      ;MOVE TO MAILBOX #  *******  723  *******
031234  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031236  000000                                  HALT                    ;V NOT CLEARED
031240                                  3$:
031240  103004                                  BCC     4$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 747              <====
031242  012742  000724                          MOV     #724,-(R2)      ;MOVE TO MAILBOX #  *******  724  *******
031246  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031250  000000                                  HALT                    ;C NOT CLEARED
031252  032767  000340  146516          4$:     BIT     #340,CC         ;TEST PRIORITY
031260  001404                                  BEQ     5$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 737              <====
031262  012742  000725                          MOV     #725,-(R2)      ;MOVE TO MAILBOX #  *******  725  *******
031266  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031270  000000                                  HALT                    ;PRIORITY NOT ZERO
031272  012706  001000                  5$:     MOV     #BUFF,SP
031276  012767  031314  146504                  MOV     #RETG,RTRAP
031304  012767  000357  146500                  MOV     #357,RTRAP+2    ;SET NEW ''CC'' AND PRIORITY
031312  000077                                  TRAPA                   ;TRAP HERE
031314                                  RETG:
031314  100404                                  BMI     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 721              <====
031316  012742  000726                          MOV     #726,-(R2)      ;MOVE TO MAILBOX #  *******  726  *******
031322  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031324  000000                                  HALT                    ;N NOT SET
031326                                  1$:
031326  001404                                  BEQ     2$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                        ;           WHICH FOLLOWS W/ 714              <====
031330  012742  000727                          MOV     #727,-(R2)      ;MOVE TO MAILBOX #  *******  727  *******
031334  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031336  000000                                  HALT                    ;Z NOT SET
031340                                  2$:
031340  102404                                  BVS     3$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                        ;           CONDITIONAL BRANCH INST. AND      <====
```

```
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 707            <====
031342  012742  000730                  MOV     #730,-(R2)      ;MOVE TO MAILBOX #  *******  730  *******
031346  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031350  000000                          HALT                    ;V NOT SET
031352                          3$:
031352  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                ;               CONDITIONAL BRANCH INST. AND    <====
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 702            <====
031354  012742  000731                  MOV     #731,-(R2)      ;MOVE TO MAILBOX #  *******  731  *******
031360  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031362  000000                          HALT                    ;C NOT SET
031364  016706  146406          4$:     MOV     CC,SP
031370  042706  000017                  BIC     #17,SP
031374  022706  000340                  CMP     #340,SP
031400  001404                          BEQ     STPPA
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                ;               CONDITIONAL BRANCH INST. AND    <====
                                                                ;               REPLACE THE MOVE INSTRUCTION    <====
                                                                ;               WHICH FOLLOWS W/ 667            <====
031402                          STPP:
031402  012742  000732                  MOV     #732,-(R2)      ;MOVE TO MAILBOX #  *******  732  *******
031406  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031410  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
031412  012767  000012  146370  STPPA:  MOV     #12,10
031420  005067  146366                  CLR     12
                                ;*****************************************************************************
                                ;TEST 311       TEST THAT A TRAP OCCURS FOR A ''TRAP'' INSTRUCTION
                                ;*****************************************************************************
031424  005212                  TS311:  INC     (R2)            ;UPDATE TEST NUMBER
031426  022712  000311                  CMP     #311,(R2)       ;SEQUENCE ERROR?
031432  001013                          BNE     TS312-10        ;BR TO ERROR HALT ON SEQ ERROR
031434  012767  000012  146346          MOV     #12,10
031442  005067  146344                  CLR     12
031446  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
031452  012767  031472  146354          MOV     #RETA1,RTRAP1   ;RETURN LOCATION
031460  104400                          TRAP                    ;RESERVED INSTRUCTION, SHOULD TRAP
031462  012742  000733                  MOV     #733,-(R2)      ;MOVE TO MAILBOX #  *******  733  *******
031466  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031470  000000                          HALT                    ;TRAP DIDN'T TRAP,OR WRONG $TSTNM
031472                          RETA1:
                                ;*****************************************************************************
                                ;TEST 312       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************
031472  005212                  TS312:  INC     (R2)            ;UPDATE TEST NUMBER
031474  022712  000312                  CMP     #312,(R2)       ;SEQUENCE ERROR?
031500  001011                          BNE     TS313-10        ;BR TO ERROR HALT ON SEQ ERROR
031502  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
031506  012767  031516  146320          MOV     #RETB1,RTRAP1   ;RETURN POINTER
031514  104400                          TRAP                    ;RESERVED INSTRUCTION
031516  020627  000774          RETB1:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
031522  001404                          BEQ     TS313
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                ;               CONDITIONAL BRANCH INST. AND    <====
```

```
                                                           ;                        REPLACE THE MOVE INSTRUCTION    <====
                                                           ;                        WHICH FOLLOWS W/ 766            <====
031524  012742  000734                  MOV     #734,-(R2)  ;MOVE TO MAILBOX #  *******  734  *******
031530  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
031532  000000                          HALT                ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                           ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 313        TEST THAT PROPER P.C. IS SAVED
                                ;*******************************************************************************
031534  005212                  TS313:  INC     (R2)        ;UPDATE TEST NUMBER
031536  022712  000313                  CMP     #313,(R2)   ;SEQUENCE ERROR?
031542  001012                          BNE     TS314-10    ;BR TO ERROR HALT ON SEQ ERROR
031544  012706  001000                  MOV     #BUFF,SP    ;STACK POINTER SETUP
031550  012767  031560  146256          MOV     #RETC1,RTRAP1  ;RETURN FROM TRAP POINTER
031556  104400                          TRAP                ;TRAP ON THIS INSTRUCTION
031560  022767  031560  147206  RETC1:  CMP     #.,BUFF-4   ;CHECK INCREMENTED P.C.
031566  001404                          BEQ     TS314
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 765            <====
031570  012742  000735                  MOV     #735,-(R2)  ;MOVE TO MAILBOX #  *******  735  *******
031574  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
031576  000000                          HALT                ;INCORRECT P.C.,OR WRONG $TSTNM
                                                           ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 314        TEST THAT "OLD" CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
031600  005212                  TS314:  INC     (R2)        ;UPDATE TEST NUMBER
031602  022712  000314                  CMP     #314,(R2)   ;SEQUENCE ERROR?
031606  001036                          BNE     TS315-10    ;BR TO ERROR HALT ON SEQ ERROR
031610  012706  001000                  MOV     #BUFF,SP    ;SET UP
031614  012767  031632  146212          MOV     #RETD1,RTRAP1  ;SET UP
031622  005067  146150                  CLR     CC          ;CLEAR CC AND PRIORITY
031626  000257                          CCC
031630  104400                          TRAP                ;TRAP
031632  026727  147140  000000  RETD1:  CMP     BUFF-2,#0   ;TEST THAT OLD STATUS WENT TO STACK
031640  001404                          BEQ     1$
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 762            <====
031642  012742  000736                  MOV     #736,-(R2)  ;MOVE TO MAILBOX #  *******  736  *******
031646  005242                          INC     -(R2)       ;SET MSGTYP TO FATAL ERROR
031650  000000                          HALT                ;INCORRECT STATUS
031652  012706  001000          1$:     MOV     #BUFF,SP    ;SET UP
031656  012767  031674  146150          MOV     #RETE1,RTRAP1  ;SET UP
031664  012767  000357  146104          MOV     #357,CC     ;SET PRIORITY
031672  104400                          TRAP                ;SET CC
031674  026727  147076  000357  RETE1:  CMP     BUFF-2,#357 ;COMPARES STATUS ON STACK
031702  001404                          BEQ     TS315
                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                           ;           CONDITIONAL BRANCH INST. AND    <====
                                                           ;           REPLACE THE MOVE INSTRUCTION    <====
                                                           ;           WHICH FOLLOWS W/ 741            <====
031704  012742  000737                  MOV     #737,-(R2)  ;MOVE TO MAILBOX #  *******  737  *******
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031710  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031712  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*****************************************************************************
                                ;TEST 315       TEST THAT ''NEW'' STATUS IS CORRECT
                                ;*****************************************************************************
031714  005212                  TS315:  INC     (R2)            ;UPDATE TEST NUMBER
031716  022712  000315                  CMP     #315,(R2)       ;SEQUENCE ERROR?
031722  001110                          BNE     TS316-10        ;BR TO ERROR HALT ON SEQ ERROR
031724  012706  001000                  MOV     #BUFF,SP
031730  012767  031744  146076          MOV     #RETF1,RTRAP1
031736  005067  146074                  CLR     RTRAP1+2        ;CLEAR FUTURE PRIORITY AND CC
031742  104400                          TRAP
031744                          RETF1:                          ;TEST FOR ''C'' CLEARED
031744  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 766            <====
031746  012742  000740                  MOV     #740,-(R2)      ;MOVE TO MAILBOX #  *******  740  *******
031752  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031754  000000                          HALT                    ;C NOT CLEARED
031756                          1$:
031756  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 761            <====
031760  012742  000741                  MOV     #741,-(R2)      ;MOVE TO MAILBOX #  *******  741  *******
031764  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
031766  000000                          HALT                    ;Z NOT CLEARED
031770                          2$:
031770  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 754            <====
031772  012742  000742                  MOV     #742,-(R2)      ;MOVE TO MAILBOX #  *******  742  *******
031776  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032000  000000                          HALT                    ;V NOT CLEARED
032002                          3$:
032002  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 747            <====
032004  012742  000743                  MOV     #743,-(R2)      ;MOVE TO MAILBOX #  *******  743  *******
032010  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032012  000000                          HALT                    ;C NOT CLEARED
032014  032767  000340  145754  4$:     BIT     #340,CC         ;TEST PRIORITY
032022  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 737            <====
032024  012742  000744                  MOV     #744,-(R2)      ;MOVE TO MAILBOX #  *******  744  *******
```

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032030 005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032032 000000                           HALT                    ;PRIORITY NOT ZERO
032034 012706 001000            5$:     MOV     #BUFF,SP
032040 012767 032056 145766             MOV     #RETG1,RTRAP1
032046 012767 000357 145762             MOV     #357,RTRAP1+2   ;SET NEW ''CC'' AND PRIORITY
032054 104400                           TRAP                    ;TRAP HERE
032056                          RETG1:
032056 100404                           BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 721           <====
032060 012742 000745                    MOV     #745,-(R2)      ;MOVE TO MAILBOX #  *******  745  *******
032064 005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032066 000000                           HALT                    ;N NOT SET
032070                          1$:
032070 001404                           BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 714           <====
032072 012742 000746                    MOV     #746,-(R2)      ;MOVE TO MAILBOX #  *******  746  *******
032076 005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032100 000000                           HALT                    ;Z NOT SET
032102                          2$:
032102 102404                           BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 707           <====
032104 012742 000747                    MOV     #747,-(R2)      ;MOVE TO MAILBOX #  *******  747  *******
032110 005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032112 000000                           HALT                    ;V NOT SET
032114                          3$:
032114 103404                           BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 702           <====
032116 012742 000750                    MOV     #750,-(R2)      ;MOVE TO MAILBOX #  *******  750  *******
032122 005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032124 000000                           HALT                    ;C NOT SET
032126 016706 145644            4$:     MOV     CC,SP
032132 042706 000017                    BIC     #17,SP
032136 022706 000340                    CMP     #340,SP
032142 001404                           BEQ     TS316
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 667           <====
032144 012742 000751                    MOV     #751,-(R2)      ;MOVE TO MAILBOX #  *******  751  *******
032150 005242                           INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032152 000000                           HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*****************************************************************************
                                ;TEST 316        TEST THAT ALL COMBINATION OF ''TRAP'' WILL CAUSE A TRAP
```

```
                                        ;*******************************************************************************
032154  005212                          TS316:  INC     (R2)            ;UPDATE TEST NUMBER
032156  022712  000316                          CMP     #316,(R2)       ;SEQUENCE ERROR?
032162  001011                                  BNE     BR45            ;BR TO ERROR HALT ON SEQ ERROR
                                                                        ;***** F11 **** ADD +376 TO SHORTEN TEST
032164  012767  104776  000012                  MOV     #TRAP+376,RB1   ;INITIALIZE BASE TRAP INSTRUCTION
032172  012767  032216  145634                  MOV     #RA1,34         ;RETURN FROM TRAP TO RA1
032200  012706  001000          RC1:    MOV     #BUFF,SP        ;SET UP STACK POINTER
032204  104400                          RB1:    TRAP                    ;TRAP INST WILL BE MODIFIED TO TRAP+377
032206                                  BR45:
032206  012742  000752                          MOV     #752,-(R2)      ;MOVE TO MAILBOX #  *******  752  *******
032212  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032214  000000                                  HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
032216  005267  177762          RA1:    INC     RB1             ;INCREMENT TRAP INSTRUCTION
032222  022767  104777  177754                  CMP     #104777,RB1     ;TRAP+377 TO UPPER LIMIT
032230  103363                                  BHIS    RC1             ;HAVE WE TESTED ALL
032232  012767  000036  145574                  MOV     #36,34
032240  005067  145572                          CLR     36
                                        ;*******************************************************************************
                                        ;TEST 317       TEST THAT A TRAP OCCURES ON AN ''IOT'' INSTRUCTION
                                        ;*******************************************************************************
032244  005212                          TS317:  INC     (R2)            ;UPDATE TEST NUMBER
032246  022712  000317                          CMP     #317,(R2)       ;SEQUENCE ERROR?
032252  001006                                  BNE     TS320-10        ;BR TO ERROR HALT ON SEQ ERROR
032254  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
032260  012767  032300  145532                  MOV     #RETA2,RTRAP2   ;RETURN LOCATION
032266  000004                                  IOT                     ;RESERVE INSTRUCTION, SHOULD TRAP
032270  012742  000753                          MOV     #753,-(R2)      ;MOVE TO MAILBOX #  *******  753  *******
032274  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032276  000000                                  HALT                    ;IOT DIDN'T TRAP,OR WRONG $TSTNM
032300                                  RETA2:
                                        ;*******************************************************************************
                                        ;TEST 320       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                        ;*******************************************************************************
032300  005212                          TS320:  INC     (R2)            ;UPDATE TEST NUMBER
032302  022712  000320                          CMP     #320,(R2)       ;SEQUENCE ERROR?
032306  001011                                  BNE     TS321-10        ;BR TO ERROR HALT ON SEQ ERROR
032310  012706  001000                          MOV     #BUFF,SP        ;STACK POINTER SETUP
032314  012767  032324  145476                  MOV     #RETB2,RTRAP2   ;RETURN POINTER
032322  000004                                  IOT                     ;RESERVED INSTRUCTION
032324  020627  000774          RETB2:  CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
032330  001404                                  BEQ     TS321
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                        ;           CONDITIONAL BRANCH INST. AND   <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                        ;           WHICH FOLLOWS W/ 766           <====
032332  012742  000754                          MOV     #754,-(R2)      ;MOVE TO MAILBOX #  *******  754  *******
032336  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
032340  000000                                  HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                        ;  OR SEQUENCE ERROR
                                        ;*******************************************************************************
                                        ;TEST 321       TEST THAT PROPER P.C. IS SAVED
                                        ;*******************************************************************************
032342  005212                          TS321:  INC     (R2)            ;UPDATE TEST NUMBER
032344  022712  000321                          CMP     #321,(R2)       ;SEQUENCE ERROR?
032350  001012                                  BNE     TS322-10        ;BR TO ERROR HALT ON SEQ ERROR
```

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032352  012706  001000                          MOV     #BUFF,SP                ;STACK POINTER SETUP
032356  012767  032366  145434                  MOV     #RETC2,RTRAP2           ;RETURN FROM TRAP POINTER
032364  000004                                  IOT                             ;TRAP ON THIS INSTRUCTION
032366  022767  032366  146400  RETC2:          CMP     #.,BUFF-4               ;CHECK FOR INCREMENTED P.C.
032374  001404                                  BEQ     TS322
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                                ;           CONDITIONAL BRANCH INST. AND        <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION        <====
                                                                                ;           WHICH FOLLOWS W/ 765                <====
032376  012742  000755                          MOV     #755,-(R2)              ;MOVE TO MAILBOX #  *******  755  *******
032402  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
032404  000000                                  HALT                            ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 322         TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                ;*******************************************************************************
032406  005212                  TS322:          INC     (R2)                    ;UPDATE TEST NUMBER
032410  022712  000322                          CMP     #322,(R2)               ;SEQUENCE ERROR?
032414  001037                                  BNE     TS323-10                ;BR TO ERROR HALT ON SEQ ERROR
032416  012706  001000                          MOV     #BUFF,SP                ;SET UP
032422  012767  032440  145370                  MOV     #RETD2,RTRAP2           ;SET UP
032430  005067  145342                          CLR     CC                      ;CLEAR CC AND PRIORITY
032434  000257                                  CCC
032436  000004                                  IOT                             ;TRAP
032440  026727  146332  000000  RETD2:          CMP     BUFF-2,#0               ;TEST THAT OLD STATUS WENT TO STACK
032446  001404                                  BEQ     1$
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                                ;           CONDITIONAL BRANCH INST. AND        <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION        <====
                                                                                ;           WHICH FOLLOWS W/ 762                <====
032450  012742  000756                          MOV     #756,-(R2)              ;MOVE TO MAILBOX #  *******  756  *******
032454  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
032456  000000                                  HALT                            ;INCORRECT STATUS
032460  012706  001000          1$:             MOV     #BUFF,SP                ;SET UP
032464  012767  032504  145326                  MOV     #RETE2,RTRAP2           ;SET UP
032472  012767  000357  145276                  MOV     #357,CC                 ;SET PRIORITY
032500  000277                                  SCC                             ;SET CC
032502  000004                                  IOT                             ;TRAP
032504  026727  146266  000357  RETE2:          CMP     BUFF-2,#357             ;COMPARES STATUS ON STACK
032512  001404                                  BEQ     TS323
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS        <====
                                                                                ;           CONDITIONAL BRANCH INST. AND        <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION        <====
                                                                                ;           WHICH FOLLOWS W/ 740                <====
032514  012742  000757                          MOV     #757,-(R2)              ;MOVE TO MAILBOX #  *******  757  *******
032520  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
032522  000000                                  HALT                            ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 323         TEST THAT ''NEW'' STATUS IS CORRECT
                                ;*******************************************************************************
032524  005212                  TS323:          INC     (R2)                    ;UPDATE TEST NUMBER
032526  022712  000323                          CMP     #323,(R2)               ;SEQUENCE ERROR?
032532  001110                                  BNE     BR46                    ;BR TO ERROR HALT ON SEQ ERROR
032534  012706  001000                          MOV     #BUFF,SP
032540  012767  032554  145252                  MOV     #RETF2,RTRAP2
```

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032546 005067 145250                     CLR    RTRAP2+2          ;CLEAR FUTURE PRIORITY AND CC
032552 000004                            IOT
032554                          RETF2:                            ;TEST FOR "C" CLEARED
032554 100004                            BPL    1$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 766            <====
032556 012742 000760                     MOV    #760,-(R2)        ;MOVE TO MAILBOX #  *******  760  *******
032562 005242                            INC    -(R2)             ;SET MSGTYP TO FATAL ERROR
032564 000000                            HALT                     ;N NOT CLEARED
032566                          1$:
032566 001004                            BNE    2$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 761            <====
032570 012742 000761                     MOV    #761,-(R2)        ;MOVE TO MAILBOX #  *******  761  *******
032574 005242                            INC    -(R2)             ;SET MSGTYP TO FATAL ERROR
032576 000000                            HALT                     ;Z NOT CLEARED
032600                          2$:
032600 102004                            BVC    3$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 754            <====
032602 012742 000762                     MOV    #762,-(R2)        ;MOVE TO MAILBOX #  *******  762  *******
032606 005242                            INC    -(R2)             ;SET MSGTYP TO FATAL ERROR
032610 000000                            HALT                     ;V NOT CLEARED
032612                          3$:
032612 103004                            BCC    4$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 747            <====
032614 012742 000763                     MOV    #763,-(R2)        ;MOVE TO MAILBOX #  *******  763  *******
032620 005242                            INC    -(R2)             ;SET MSGTYP TO FATAL ERROR
032622 000000                            HALT                     ;C NOT CLEARED
032624 032767 000340 145144     4$:      BIT    #340,CC           ;TEST PRIORITY
032632 001404                            BEQ    5$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 737            <====
032634 012742 000764                     MOV    #764,-(R2)        ;MOVE TO MAILBOX #  *******  764  *******
032640 005242                            INC    -(R2)             ;SET MSGTYP TO FATAL ERROR
032642 000000                            HALT                     ;PRIORITY NOT ZERO
032644 012706 001000            5$:      MOV    #BUFF,SP
032650 012767 032666 145142              MOV    #RETG2,RTRAP2
032656 012767 000357 145136              MOV    #357,RTRAP2+2     ;SET NEW "CC" AND PRIORITY
032664 000004                            IOT                      ;TRAP HERE
032666                          RETG2:
032666 100404                            BMI    1$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
```

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                                                          ;          WHICH FOLLOWS W/ 721           <====
032670  012742  000765                MOV    #765,-(R2)   ;MOVE TO MAILBOX #  *******  765  *******
032674  005242                        INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
032676  000000                        HALT                ;N NOT SET
032700                        1$:
032700  001404                        BEQ    2$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 714          <====
032702  012742  000766                MOV    #766,-(R2)   ;MOVE TO MAILBOX #  *******  766  *******
032706  005242                        INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
032710  000000                        HALT                ;Z NOT SET
032712                        2$:
032712  102404                        BVS    3$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 707          <====
032714  012742  000767                MOV    #767,-(R2)   ;MOVE TO MAILBOX #  *******  767  *******
032720  005242                        INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
032722  000000                        HALT                ;V NOT SET
032724                        3$:
032724  103404                        BCS    4$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 702          <====
032726  012742  000770                MOV    #770,-(R2)   ;MOVE TO MAILBOX #  *******  770  *******
032732  005242                        INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
032734  000000                        HALT                ;C NOT SET
032736  016706  145034        4$:     MOV    CC,SP
032742  042706  000017                BIC    #17,SP
032746  022706  000340                CMP    #340,SP
032752  001404                        BEQ    BR46A
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS  <====
                                                          ;           CONDITIONAL BRANCH INST. AND  <====
                                                          ;           REPLACE THE MOVE INSTRUCTION  <====
                                                          ;           WHICH FOLLOWS W/ 667          <====
032754                        BR46:
032754  012742  000771                MOV    #771,-(R2)   ;MOVE TO MAILBOX #  *******  771  *******
032760  005242                        INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
032762  000000                        HALT                ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
032764  012767  000022  145026  BR46A: MOV   #22,20       ;.+2
032772  005067  145024                CLR    22           ;HALT
                              ;*************************************************************************
                              ;TEST 324        TEST THAT A TRAP OCCURS ON AN EMT  INSTRUCTION
                              ;*************************************************************************
032776  005212                TS324:  INC    (R2)         ;UPDATE TEST NUMBER
033000  022712  000324                CMP    #324,(R2)    ;SEQUENCE ERROR?
033004  001006                        BNE    TS325-10     ;BR TO ERROR HALT ON SEQ ERROR
033006  012706  001000                MOV    #BUFF,SP     ;STACK POINTER SETUP
033012  012767  033032  145010        MOV    #RETA3,RTRAP3 ;RETURN LOCATION
033020  104000                        EMT                 ;RESERVE INSTRUCTIOM, SHOULD TRAP
033022  012742  000772                MOV    #772,-(R2)   ;MOVE TO MAILBOX #  *******  772  *******
033026  005242                        INC    -(R2)        ;SET MSGTYP TO FATAL ERROR
```

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033030  000000                           HALT                        ;EMT DIDN'T TRAP,OR WRONG $TSTNM
033032                           RETA3:

                                 ;*******************************************************************************
                                 ;TEST 325         TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                 ;*******************************************************************************
033032  005212                   TS325:  INC     (R2)                ;UPDATE TEST NUMBER
033034  022712  000325                   CMP     #325,(R2)           ;SEQUENCE ERROR?
033040  001011                           BNE     TS326-10            ;BR TO ERROR HALT ON SEQ ERROR
033042  012706  001000                   MOV     #BUFF,SP            ;STACK POINTER SETUP
033046  012767  033056  144754           MOV     #RETB3,RTRAP3       ;RETURN POINTER
033054  104000                           EMT                         ;RESERVED INSTRUCTION
033056  020627  000774           RETB3:  CMP     SP,#BUFF-4          ;TEST DECREMENT OF SP
033062  001404                           BEQ     TS326
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                     ;           CONDITIONAL BRANCH INST. AND   <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                     ;           WHICH FOLLOWS W/ 766           <====
033064  012742  000773                   MOV     #773,-(R2)          ;MOVE TO MAILBOX #  *******  773  *******
033070  005242                           INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033072  000000                           HALT                        ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                     ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************
                                 ;TEST 326         TEST THAT PROPER P.C. IS SAVED
                                 ;*******************************************************************************
033074  005212                   TS326:  INC     (R2)                ;UPDATE TEST NUMBER
033076  022712  000326                   CMP     #326,(R2)           ;SEQUENCE ERROR?
033102  001012                           BNE     TS327-10            ;BR TO ERROR HALT ON SEQ ERROR
033104  012706  001000                   MOV     #BUFF,SP            ;STACK POINTER SETUP
033110  012767  033120  144712           MOV     #RETC3,RTRAP3       ;RTURN FROM TRAP POINTER
033116  104000                           EMT                         ;TRAP ON THIS INSTRICTION
033120  022767  033120  145646   RETC3:  CMP     #.,BUFF-4           ;CHECK FOR INCREMENTED P.C.
033126  001404                           BEQ     TS327
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                     ;           CONDITIONAL BRANCH INST. AND   <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                     ;           WHICH FOLLOWS W/ 765           <====
033130  012742  000774                   MOV     #774,-(R2)          ;MOVE TO MAILBOX #  *******  774  *******
033134  005242                           INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033136  000000                           HALT                        ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                     ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************
                                 ;TEST 327         TEST THAT 'OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                 ;*******************************************************************************
033140  005212                   TS327:  INC     (R2)                ;UPDATE TEST NUMBER
033142  022712  000327                   CMP     #327,(R2)           ;SEQUENCE ERROR?
033146  001037                           BNE     TS330-10            ;BR TO ERROR HALT ON SEQ ERROR
033150  012706  001000                   MOV     #BUFF,SP            ;SET UP
033154  012767  033172  144646           MOV     #RETD3,RTRAP3       ;SET UP
033162  005067  144610                   CLR     CC                  ;CLEAR CC AND PRIORITY
033166  000257                           CCC
033170  104000                           EMT                         ;TRAP
033172  026727  145600  000000   RETD3:  CMP     BUFF-2,#0           ;TEST THAT OLD STATUS WENT TO STACK
033200  001404                           BEQ     1$
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                     ;           CONDITIONAL BRANCH INST. AND   <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION   <====
```

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                                                                 ;        WHICH FOLLOWS W/ 762         <====
033202 012742 000775                    MOV     #775,-(R2)       ;MOVE TO MAILBOX #  *******  775  *******
033206 005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
033210 000000                           HALT                     ;INCORRECT STATUS
033212 012706 001000            1$:     MOV     #BUFF,SP         ;SET UP
033216 012767 033236 144604             MOV     #RETE3,RTRAP3    ;SET UP
033224 012767 000357 144544             MOV     #357,CC          ;SET PRIORITY
033232 000277                           SCC                      ;SET CC
033234 104000                           EMT                      ;TRAP
033236 026727 145534 000357     RETE3:  CMP     BUFF-2,#357      ;COMPARES STATUS ON STACK
033244 001404                           BEQ     TS330
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 740            <====
033246 012742 000776                    MOV     #776,-(R2)       ;MOVE TO MAILBOX #  *******  776  *******
033252 005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
033254 000000                           HALT                     ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                 ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 330        TEST THAT ''NEW'' STATUS IS CORRECT
                                ;*******************************************************************************
033256 005212                   TS330:  INC     (R2)             ;UPDATE TEST NUMBER
033260 022712 000330                    CMP     #330,(R2)        ;SEQUENCE ERROR?
033264 001106                           BNE     TS331-10         ;BR TO ERROR HALT ON SEQ ERROR
033266 012706 001000                    MOV     #BUFF,SP
033272 012767 033306 144530             MOV     #RETF3,RTRAP3
033300 005067 144526                    CLR     RTRAP3+2         ;CLEAR FUTURE PRIORITY AND CC
033304 104000                           EMT
033306                          RETF3:                           ;TEST FOR ''C'' CLEARED
033306 100004                           BPL     1$
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 766            <====
033310 012742 000777                    MOV     #777,-(R2)       ;MOVE TO MAILBOX #  *******  777  *******
033314 005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
033316 000000                           HALT                     ;C NOT CLEARED
033320                          1$:
033320 001004                           BNE     2$
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 761            <====
033322 012742 001000                    MOV     #1000,-(R2)      ;MOVE TO MAILBOX #  *******  1000  *******
033326 005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
033330 000000                           HALT                     ;Z NOT CLEARED
033332                          2$:
033332 102004                           BVC     3$
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                 ;           CONDITIONAL BRANCH INST. AND    <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                 ;           WHICH FOLLOWS W/ 754            <====
033334 012742 001001                    MOV     #1001,-(R2)      ;MOVE TO MAILBOX #  *******  1001  *******
033340 005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
033342 000000                           HALT                     ;V NOT CLEARED
```

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033344                              3$:
033344  103004                              BCC     4$
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 747             <====
033346  012742  001002                      MOV     #1002,-(R2)     ;MOVE TO MAILBOX #  *******  1002  *******
033352  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033354  000000                              HALT                    ;C NOT CLEARED
033356  032767  000340  144412      4$:     BIT     #340,CC         ;TEST PRIORITY
033364  001404                              BEQ     5$
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 737             <====
033366  012742  001003                      MOV     #1003,-(R2)     ;MOVE TO MAILBOX #  *******  1003  *******
033372  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033374  000000                              HALT                    ;PRIORITY NOT ZERO
033376  012706  001000              5$:     MOV     #BUFF,SP
033402  012767  033420  144420              MOV     #RETG3,RTRAP3
033410  012767  000357  144414              MOV     #357,RTRAP3+2   ;SET NEW "CC" AND PRIORITY
033416  104000                              EMT                     ;TRAP HERE
033420                              RETG3:
033420  100404                              BMI     1$
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 721             <====
033422  012742  001004                      MOV     #1004,-(R2)     ;MOVE TO MAILBOX #  *******  1004  *******
033426  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033430  000000                              HALT                    ;N NOT SET
033432                              1$:
033432  001404                              BEQ     2$
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 714             <====
033434  012742  001005                      MOV     #1005,-(R2)     ;MOVE TO MAILBOX #  *******  1005  *******
033440  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033442  000000                              HALT                    ;Z NOT SET
033444                              2$:
033444  102404                              BVS     3$
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 707             <====
033446  012742  001006                      MOV     #1006,-(R2)     ;MOVE TO MAILBOX #  *******  1006  *******
033452  005242                              INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033454  000000                              HALT                    ;V NOT SET
033456                              3$:
033456  103404                              BCS     4$
                                                                    ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                    ;           CONDITIONAL BRANCH INST. AND     <====
                                                                    ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                    ;           WHICH FOLLOWS W/ 702             <====
033460  012742  001007                      MOV     #1007,-(R2)     ;MOVE TO MAILBOX #  *******  1007  *******
```

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033464  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033466  000000                          HALT                    ;C NOT SET
033470  000257                  4$:     CCC
033472  022767  000340  144276          CMP     #340,CC
033500  001404                          BEQ     TS331
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 671            <====
033502  012742  001010                  MOV     #1010,-(R2)     ;MOVE TO MAILBOX #  *******  1010  *******
033506  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033510  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 331       TEST THAT ALL COMBINATION OF EMT WILL CAUSE A TRAP
                                ;*******************************************************************************
033512  005212                  TS331:  INC     (R2)            ;UPDATE TEST NUMBER
033514  022712  000331                  CMP     #331,(R2)       ;SEQUENCE ERROR?
033520  001011                          BNE     BR47            ;BR TO ERROR HALT ON SEQ ERROR
                                                                ;**** F11 **** ADD +376 TO SHORTEN TEST
033522  012767  104376  000012          MOV     #EMT+376,RB     ;       ;INITIALIZE BASE EMT INSTRUCTION
033530  012767  033554  144272          MOV     #RA,30          ;RETURN FROM TRAP TO RA
033536  012706  001000          RC:     MOV     #BUFF,SP        ;SET UP STACK POINTER
033542  104000                  RB:     EMT                     ;TRAP INST. WILL BE MODIFIED TO EMT+377
033544                          BR47:
033544  012742  001011                  MOV     #1011,-(R2)     ;MOVE TO MAILBOX #  *******  1011  *******
033550  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033552  000000                          HALT                    ;PREVIOUS INST FAILED TO TRAP,OR WRONG $TSTNM
033554  005267  177762          RA:     INC     RB              ;INCREMENT TRAP INSTRUCTION
033560  022767  104377  177754          CMP     #104377,RB      ;EMT+377 TO EMT?
033566  103363                          BHIS    RC              ;HAVE WE TESTED ALL
                                                                ;YES
033570  012767  000032  144232          MOV     #32,30          ;/.+
033576  005067  144230                  CLR     32              ;HALT
                                ;*******************************************************************************
                                ;TEST 332       TEST THAT A TRAP OCCURES ON AN ''TRACE-TRT'' INSTRUCTION
                                ;*******************************************************************************
033602  005212                  TS332:  INC     (R2)            ;UPDATE TEST NUMBER
033604  022712  000332                  CMP     #332,(R2)       ;SEQUENCE ERROR?
033610  001006                          BNE     TS333-10        ;BR TO ERROR HALT ON SEQ ERROR
033612  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033616  012767  033636  144170          MOV     #RETA4,RTRAP4   ;RETURN LOCATION
033624  000003                          TRT                     ;RESERVED INSTRUCTION, SHOULD TRAP
033626  012742  001012                  MOV     #1012,-(R2)     ;MOVE TO MAILBOX #  *******  1012  *******
033632  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
033634  000000                          HALT                    ;TRT DIDN'T TRAP,OR WRONG $TSTNM
033636                          RETA4:
                                ;*******************************************************************************
                                ;TEST 333       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*******************************************************************************
033636  005212                  TS333:  INC     (R2)            ;UPDATE TEST NUMBER
033640  022712  000333                  CMP     #333,(R2)       ;SEQUENCE ERROR?
033644  001011                          BNE     TS334-10        ;BR TO ERROR HALT ON SEQ ERROR
033646  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
033652  012767  033662  144134          MOV     #RETB4,RTRAP4   ;RETURN POINTER
033660  000003                          TRT                     ;RESERVED INSTRUCTION
```

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033662 020627 000774          RETB4:  CMP     SP,#BUFF-4          ;TEST DECREMENT OF SP
033666 001404                         BEQ     TS334
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                  ;           CONDITIONAL BRANCH INST. AND      <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                  ;           WHICH FOLLOWS W/ 766              <====
033670 012742 001013                  MOV     #1013,-(R2)         ;MOVE TO MAILBOX #  *******  1013  *******
033674 005242                         INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033676 000000                         HALT                        ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                  ;  OR SEQUENCE ERROR
                              ;*******************************************************************************
                              ;TEST 334        TEST THAT PROPER P.C. IS SAVED
                              ;*******************************************************************************
033700 005212                 TS334:  INC     (R2)                ;UPDATE TEST NUMBER
033702 022712 000334                  CMP     #334,(R2)           ;SEQUENCE ERROR?
033706 001012                         BNE     TS335-10            ;BR TO ERROR HALT ON SEQ ERROR
033710 012706 001000                  MOV     #BUFF,SP            ;STACK POINTER SETUP
033714 012767 033724 144072           MOV     #RETC4,RTRAP4       ;RETURN FROM TRAP POINTER
033722 000003                         TRT                         ;TRAP ON THIS INSTRUCTION
033724 022767 033724 145042   RETC4:  CMP     #.,BUFF-4           ;CHECK FOR INCREMENTED P.C.
033732 001404                         BEQ     TS335
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                  ;           CONDITIONAL BRANCH INST. AND      <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                  ;           WHICH FOLLOWS W/ 765              <====
033734 012742 001014                  MOV     #1014,-(R2)         ;MOVE TO MAILBOX #  *******  1014  *******
033740 005242                         INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
033742 000000                         HALT                        ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                  ;  OR SEQUENCE ERROR
                              ;*******************************************************************************
                              ;TEST 335        TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                              ;*******************************************************************************
033744 005212                 TS335:  INC     (R2)                ;UPDATE TEST NUMBER
033746 022712 000335                  CMP     #335,(R2)           ;SEQUENCE ERROR?
033752 001037                         BNE     TS336-10            ;BR TO ERROR HALT ON SEQ ERROR
033754 012706 001000                  MOV     #BUFF,SP            ;SET UP
033760 012767 033776 144026           MOV     #RETD4,RTRAP4       ;SET UP
033766 005067 144004                  CLR     CC                  ;CLEAR CC AND PRIORITY
033772 000257                         CCC
033774 000003                         TRT                         ;TRAP
033776 026727 144774 000000   RETD4:  CMP     BUFF-2,#0           ;TEST THAT OLD STATUS WENT TO STACK
                                                                  ;TEST FOR ALL ZEROS
034004 001404                         BEQ     1$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                  ;           CONDITIONAL BRANCH INST. AND      <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                  ;           WHICH FOLLOWS W/ 762              <====
034006 012742 001015                  MOV     #1015,-(R2)         ;MOVE TO MAILBOX #  *******  1015  *******
034012 005242                         INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
034014 000000                         HALT                        ;INCORRECT STATUS
034016 012706 001000          1$:     MOV     #BUFF,SP            ;SET UP
034022 012767 034042 143764           MOV     #RETE4,RTRAP4       ;SET UP
034030 012767 000357 143740           MOV     #357,CC             ;SET PRIORITY
034036 000277                         SCC                         ;SET-SET CC
034040 000003                         TRT                         ;TRAP
034042 026727 144730 000357   RETE4:  CMP     BUFF-2,#357         ;COMPARES STATUS ON STACK
```

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034050  001404                          BEQ     TS336
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 740              <====
034052  012742  001016                  MOV     #1016,-(R2)     ;MOVE TO MAILBOX #  *******  1016  *******
034056  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034060  000000                          HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 336       TEST THAT 'NEW' STATUS IS CORRECT
                                ;*******************************************************************************
034062  005212                  TS336:  INC     (R2)            ;UPDATE TEST NUMBER
034064  022712  000336                  CMP     #336,(R2)       ;SEQUENCE ERROR?
034070  001110                          BNE     BR51            ;BR TO ERROR HALT ON SEQ ERROR
034072  012706  001000                  MOV     #BUFF,SP
034076  012767  034112  143710          MOV     #RETF4,RTRAP4
034104  005067  143706                  CLR     RTRAP4+2        ;CLEAR FUTURE PRIORITY AND CC
034110  000003                          TRT
034112                          RETF4:                          ;TEST FOR "C" CLEARED
034112  100004                          BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 766              <====
034114  012742  001017                  MOV     #1017,-(R2)     ;MOVE TO MAILBOX #  *******  1017  *******
034120  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034122  000000                          HALT                    ;C NOT CLEARED
034124                          1$:
034124  001004                          BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 761              <====
034126  012742  001020                  MOV     #1020,-(R2)     ;MOVE TO MAILBOX #  *******  1020  *******
034132  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034134  000000                          HALT                    ;Z NOT CLEARED
034136                          2$:
034136  102004                          BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 754              <====
034140  012742  001021                  MOV     #1021,-(R2)     ;MOVE TO MAILBOX #  *******  1021  *******
034144  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034146  000000                          HALT                    ;V NOT CLEARED
034150                          3$:
034150  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                                ;           CONDITIONAL BRANCH INST. AND      <====
                                                                ;           REPLACE THE MOVE INSTRUCTION      <====
                                                                ;           WHICH FOLLOWS W/ 747              <====
034152  012742  001022                  MOV     #1022,-(R2)     ;MOVE TO MAILBOX #  *******  1022  *******
034156  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034160  000000                          HALT                    ;C NOT CLEARED
034162  032767  000340  143606  4$:     BIT     #340,CC         ;TEST PRIORITY
```

```
034170  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 737           <====
034172  012742  001023                  MOV     #1023,-(R2)     ;MOVE TO MAILBOX #  *******  1023  *******
034176  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034200  000000                          HALT                    ;PRIORITY NOT ZERO
034202  012706  001000          5$:     MOV     #BUFF,SP
034206  012767  034224  143600          MOV     #RETG4,RTRAP4
034214  012767  000357  143574          MOV     #357,RTRAP4+2   ;SET NEW ''CC'' AND PRIORITY
034222  000003                          TRT                     ;TRAP HERE
034224                          RETG4:
034224  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 721           <====
034226  012742  001024                  MOV     #1024,-(R2)     ;MOVE TO MAILBOX #  *******  1024  *******
034232  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034234  000000                          HALT                    ;N NOT SET
034236                          1$:
034236  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 714           <====
034240  012742  001025                  MOV     #1025,-(R2)     ;MOVE TO MAILBOX #  *******  1025  *******
034244  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034246  000000                          HALT                    ;Z NOT SET
034250                          2$:
034250  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 707           <====
034252  012742  001026                  MOV     #1026,-(R2)     ;MOVE TO MAILBOX #  *******  1026  *******
034256  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034260  000000                          HALT                    ;V NOT SET
034262                          3$:
034262  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 702           <====
034264  012742  001027                  MOV     #1027,-(R2)     ;MOVE TO MAILBOX #  *******  1027  *******
034270  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034272  000000                          HALT                    ;C NOT SET
034274  016706  143476          4$:     MOV     CC,SP
034300  042706  000017                  BIC     #17,SP
034304  022706  000340                  CMP     #340,SP
034310  001404                          BEQ     BR51A
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                ;           WHICH FOLLOWS W/ 667           <====
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034312                          BR51:
034312  012742  001030                  MOV     #1030,-(R2)         ;MOVE TO MAILBOX #  *******  1030  *******
034316  005242                          INC     -(R2)               ;SET MSGTYP TO FATAL ERROR
034320  000000                          HALT                        ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
034322  012767  000016  143464  BR51A:  MOV     #16,14
034330  005067  143462                  CLR     16

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

                                ;*************************************************************************************
                                ;TEST 337        TEST THAT A TRAP OCCURS ON AN ILLEGAL INSTRUCTION
                                ;*************************************************************************************
034334  005212                  TS337:  INC     (R2)                ;UPDATE TEST NUMBER
034336  022712  000337                  CMP     #337,(R2)           ;SEQUENCE ERROR?
034342  001006                          BNE     TS340-10            ;BR TO ERROR HALT ON SEQ ERROR
034344  012706  001000                  MOV     #BUFF,SP            ;STACK POINTER SETUP
034350  012767  034370  143426          MOV     #RETA5,RTRAP5       ;RETURN LOCATION
034356  000100                          JMP     %0                  ;ILLEGAL INSTRUCTION, SHOULD TRAP
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034360  012742  001031                   MOV     #1031,-(R2)      ;MOVE TO MAILBOX #  *******  1031  *******
034364  005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
034366  000000                           HALT                     ;ILLEGAL INSTRUCTION DIDN'T TRAP,OR WRONG $TSTNM
034370                           RETA5:
                                 ;*******************************************************************************
                                 ;TEST 340        TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                 ;*******************************************************************************
034370  005212                   TS340:  INC     (R2)             ;UPDATE TEST NUMBER
034372  022712  000340                   CMP     #340,(R2)        ;SEQUENCE ERROR?
034376  001011                           BNE     TS341-10         ;BR TO ERROR HALT ON SEQ ERROR
034400  012706  001000                   MOV     #BUFF,SP         ;STACK POINTER SETUP
034404  012767  034414  143372           MOV     #RETB5,RTRAP5    ;RETURN POINTER
034412  000100                           JMP     %0               ;RESERVED INSTRUCTION
034414  020627  000774           RETB5:  CMP     SP,#BUFF-4       ;TEST DECREMENT OF SP
034420  001404                           BEQ     TS341
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 766            <====
034422  012742  001032                   MOV     #1032,-(R2)      ;MOVE TO MAILBOX #  *******  1032  *******
034426  005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
034430  000000                           HALT                     ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                  ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************
                                 ;TEST 341        TEST THAT PROPER P.C. IS SAVED
                                 ;*******************************************************************************
034432  005212                   TS341:  INC     (R2)             ;UPDATE TEST NUMBER
034434  022712  000341                   CMP     #341,(R2)        ;SEQUENCE ERROR?
034440  001012                           BNE     TS342-10         ;BR TO ERROR HALT ON SEQ ERROR
034442  012706  001000                   MOV     #BUFF,SP         ;STACK POINTER SETUP
034446  012767  034456  143330           MOV     #RETC5,RTRAP5    ;RETURN FROM TRAP POINTER
034454  000100                           JMP     %0               ;TRAP ON THIS INSTRUCTION
034456  022767  034456  144310   RETC5:  CMP     #.,BUFF-4        ;CHECK FOR INCREMENTED P.C.
034464  001404                           BEQ     TS342
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                  ;           CONDITIONAL BRANCH INST. AND    <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                  ;           WHICH FOLLOWS W/ 765            <====
034466  012742  001033                   MOV     #1033,-(R2)      ;MOVE TO MAILBOX #  *******  1033  *******
034472  005242                           INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
034474  000000                           HALT                     ;INCORRECT P.C.,OR WRONG $TSTNM
                                                                  ;  OR SEQUENCE ERROR
                                 ;*******************************************************************************
                                 ;TEST 342        TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                                 ;*******************************************************************************
034476  005212                   TS342:  INC     (R2)             ;UPDATE TEST NUMBER
034500  022712  000342                   CMP     #342,(R2)        ;SEQUENCE ERROR?
034504  001037                           BNE     TS343-10         ;BR TO ERROR HALT ON SEQ ERROR
034506  012706  001000                   MOV     #BUFF,SP         ;SET UP
034512  012767  034530  143264           MOV     #RETD5,RTRAP5    ;SET UP
034520  005067  143252                   CLR     CC               ;CLEAR CC AND PRIORITY
034524  000257                           CCC
034526  000100                           JMP     %0               ;TRAP
034530  026727  144242  000000   RETD5:  CMP     BUFF-2,#0        ;TEST THAT OLD STATUS WENT TO STACK
034536  001404                           BEQ     1$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
```

```
                                                            ;               CONDITIONAL BRANCH INST. AND    <====
                                                            ;               REPLACE THE MOVE INSTRUCTION    <====
                                                            ;               WHICH FOLLOWS W/ 762            <====
034540  012742  001034                  MOV     #1034,-(R2)  ;MOVE TO MAILBOX #  *******  1034  *******
034544  005242                          INC     -(R2)        ;SET MSGTYP TO FATAL ERROR
034546  000000                          HALT                 ;INCORRECT STATUS
034550  012706  001000          1$:     MOV     #BUFF,SP     ;SET UP
034554  012767  034574  143222          MOV     #RETE5,RTRAP5 ;SET UP
034562  012767  000357  143206          MOV     #357,CC      ;SET PRIORITY
034570  000277                          SCC                  ;SET CC
034572  000100                          JMP     %0           ;TRAP
034574  026727  144176  000357  RETE5:  CMP     BUFF-2,#357  ;COMPARES STATUS ON STACK
034602  001404                          BEQ     TS343
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;               CONDITIONAL BRANCH INST. AND    <====
                                                            ;               REPLACE THE MOVE INSTRUCTION    <====
                                                            ;               WHICH FOLLOWS W/ 740            <====
034604  012742  001035                  MOV     #1035,-(R2)  ;MOVE TO MAILBOX #  *******  1035  *******
034610  005242                          INC     -(R2)        ;SET MSGTYP TO FATAL ERROR
034612  000000                          HALT                 ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                            ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 343       TEST THAT "NEW" STATUS IS CORRECT
                                ;*******************************************************************************
034614  005212                  TS343:  INC     (R2)         ;UPDATE TEST NUMBER
034616  022712  000343                  CMP     #343,(R2)    ;SEQUENCE ERROR?
034622  001106                          BNE     TS344-10     ;BR TO ERROR HALT ON SEQ ERROR
034624  012706  001000                  MOV     #BUFF,SP
034630  012767  034644  143146          MOV     #RETF5,RTRAP5
034636  005067  143144                  CLR     RTRAP5+2     ;CLEAR FUTURE PRIORITY AND CC
034642  000100                          JMP     %0
034644                          RETF5:                       ;TEST FOR "C" CLEARED
034644  100004                          BPL     1$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;               CONDITIONAL BRANCH INST. AND    <====
                                                            ;               REPLACE THE MOVE INSTRUCTION    <====
                                                            ;               WHICH FOLLOWS W/ 766            <====
034646  012742  001036                  MOV     #1036,-(R2)  ;MOVE TO MAILBOX #  *******  1036  *******
034652  005242                          INC     -(R2)        ;SET MSGTYP TO FATAL ERROR
034654  000000                          HALT                 ;C NOT CLEARED
034656                          1$:
034656  001004                          BNE     2$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;               CONDITIONAL BRANCH INST. AND    <====
                                                            ;               REPLACE THE MOVE INSTRUCTION    <====
                                                            ;               WHICH FOLLOWS W/ 761            <====
034660  012742  001037                  MOV     #1037,-(R2)  ;MOVE TO MAILBOX #  *******  1037  *******
034664  005242                          INC     -(R2)        ;SET MSGTYP TO FATAL ERROR
034666  000000                          HALT                 ;Z NOT CLEARED
034670                          2$:
034670  102004                          BVC     3$
                                                            ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                            ;               CONDITIONAL BRANCH INST. AND    <====
                                                            ;               REPLACE THE MOVE INSTRUCTION    <====
                                                            ;               WHICH FOLLOWS W/ 754            <====
034672  012742  001040                  MOV     #1040,-(R2)  ;MOVE TO MAILBOX #  *******  1040  *******
```

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034676  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034700  000000                          HALT                    ;V NOT CLEARED
034702                          3$:
034702  103004                          BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 747            <====
034704  012742  001041                  MOV     #1041,-(R2)     ;MOVE TO MAILBOX #  *******  1041  *******
034710  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034712  000000                          HALT                    ;C NOT CLEARED
034714  032767  000357  143054  4$:     BIT     #357,CC         ;TEST PRIORITY
034722  001404                          BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 737            <====
034724  012742  001042                  MOV     #1042,-(R2)     ;MOVE TO MAILBOX #  *******  1042  *******
034730  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034732  000000                          HALT                    ;PRIORITY NOT ZERO
034734  012706  001000          5$:     MOV     #BUFF,SP
034740  012767  034756  143036          MOV     #RETG5,RTRAP5
034746  012767  000357  143032          MOV     #357,RTRAP5+2   ;SET NEW "CC" AND PRIORITY
034754  000100                          JMP     %0              ;TRAP HERE
034756                          RETG5:
034756  100404                          BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 721            <====
034760  012742  001043                  MOV     #1043,-(R2)     ;MOVE TO MAILBOX #  *******  1043  *******
034764  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
034766  000000                          HALT                    ;N NOT SET
034770                          1$:
034770  001404                          BEQ     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 714            <====
034772  012742  001044                  MOV     #1044,-(R2)     ;MOVE TO MAILBOX #  *******  1044  *******
034776  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035000  000000                          HALT                    ;Z NOT SET
035002                          2$:
035002  102404                          BVS     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                ;           WHICH FOLLOWS W/ 707            <====
035004  012742  001045                  MOV     #1045,-(R2)     ;MOVE TO MAILBOX #  *******  1045  *******
035010  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035012  000000                          HALT                    ;V NOT SET
035014                          3$:
035014  103404                          BCS     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND    <====
                                                                ;           REPLACE THE MOVE INSTRUCTION    <====
```

```
                                                                ;               WHICH FOLLOWS W/ 702           <====
035016  012742  001046                  MOV     #1046,-(R2)     ;MOVE TO MAILBOX #  *******  1046  *******
035022  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035024  000000                          HALT                    ;C NOT SET
035026  016706  142744          4$:     MOV     CC,SP
035032  022706  000357                  CMP     #357,SP
035036  001404                          BEQ     TS344
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                ;           CONDITIONAL BRANCH INST. AND       <====
                                                                ;           REPLACE THE MOVE INSTRUCTION       <====
                                                                ;           WHICH FOLLOWS W/ 671               <====
035040  012742  001047                  MOV     #1047,-(R2)     ;MOVE TO MAILBOX #  *******  1047  *******
035044  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035046  000000                          HALT                    ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*****************************************************************************
                                ;TEST 344       TEST THAT A TRAP OCCURES ON ALL ILLEGAL INSTRUCION
                                ;*****************************************************************************
035050  005212                  TS344:  INC     (R2)            ;UPDATE TEST NUMBER
035052  022712  000344                  CMP     #344,(R2)       ;SEQUENCE ERROR?
035056  001006                          BNE     TS345-10        ;BR TO ERROR HALT ON SEQ ERROR
035060  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
035064  012767  035104  142712          MOV     #RETH5,RTRAP5   ;RETURN LOCATION
035072  004000                          JSR     %0,%0           ;RESERVED INSTRUCTION, SHOULD TRAP
035074  012742  001050                  MOV     #1050,-(R2)     ;MOVE TO MAILBOX #  *******  1050  *******
035100  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035102  000000                          HALT                    ;DIDN'T TRAP,OR WRONG $TSTNM
035104                          RETH5:
                                ;*****************************************************************************
                                ;TEST 345       TEST DECREMENT OF STACK POINTER ON A TRAP OPERATION
                                ;*****************************************************************************
035104  005212                  TS345:  INC     (R2)            ;UPDATE TEST NUMBER
035106  022712  000345                  CMP     #345,(R2)       ;SEQUENCE ERROR?
035112  001011                          BNE     TS346-10        ;BR TO ERROR HALT ON SEQ ERROR
035114  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
035120  012767  035130  142656          MOV     #RETJ,RTRAP5    ;RETURN POINTER
035126  004000                          JSR     %0,%0           ;RESERVED INSTRUCTION
035130  020627  000774          RETJ:   CMP     SP,#BUFF-4      ;TEST DECREMENT OF SP
035134  001404                          BEQ     TS346
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS       <====
                                                                ;           CONDITIONAL BRANCH INST. AND       <====
                                                                ;           REPLACE THE MOVE INSTRUCTION       <====
                                                                ;           WHICH FOLLOWS W/ 766               <====
035136  012742  001051                  MOV     #1051,-(R2)     ;MOVE TO MAILBOX #  *******  1051  *******
035142  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035144  000000                          HALT                    ;NOT DECREMENTED TWO WORDS,OR WRONG $TSTNM
                                                                ;  OR SEQUENCE ERROR
                                ;*****************************************************************************
                                ;TEST 346       TEST THAT PROPER P.C. IS SAVED
                                ;*****************************************************************************
035146  005212                  TS346:  INC     (R2)            ;UPDATE TEST NUMBER
035150  022712  000346                  CMP     #346,(R2)       ;SEQUENCE ERROR?
035154  001012                          BNE     TS347-10        ;BR TO ERROR HALT ON SEQ ERROR
035156  012706  001000                  MOV     #BUFF,SP        ;STACK POINTER SETUP
035162  012767  035172  142614          MOV     #RETK,RTRAP5    ;RETURN FROM TRAP POINTER
035170  004000                  INSTK:  JSR     %0,%0           ;TRAP ON THIS INSTRUCTION
```

```
035172 022767 035172 143574  RETK:   CMP     #INSTK+2,BUFF-4 ;CHECK FOR INCREMENED P.C.
035200 001404                         BEQ     TS347
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 765            <====
035202 012742 001052                  MOV     #1052,-(R2)     ;MOVE TO MAILBOX #  *******  1052  *******
035206 005242                         INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035210 000000                         HALT                    ;INCORRECT P.C.,OR WRONG $TSTNM
                                                      ;  OR SEQUENCE ERROR

                             ;*******************************************************************************
                             ;TEST 347        TEST THAT ''OLD'' CC AND PRIORITY ARE PLACED ON STACK
                             ;*******************************************************************************
035212 005212                TS347:  INC     (R2)            ;UPDATE TEST NUMBER
035214 022712 000347                  CMP     #347,(R2)       ;SEQUENCE ERROR?
035220 001037                         BNE     TS350-10        ;BR TO ERROR HALT ON SEQ ERROR
035222 012706 001000                  MOV     #BUFF,SP        ;SET UP
035226 012767 035244 142550           MOV     #RETL,RTRAP5    ;SET UP
035234 005067 142536                  CLR     CC              ;CLEAR CC AND PRIORITY
035240 000257                         CCC
035242 004000                         JSR     %0,%0           ;TRAP
035244 026727 143526 000000  RETL:   CMP     BUFF-2,#0       ;TEST THAT OLD STATUS WENT TO STACK
035252 001404                         BEQ     1$
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 762            <====
035254 012742 001053                  MOV     #1053,-(R2)     ;MOVE TO MAILBOX #  *******  1053  *******
035260 005242                         INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035262 000000                         HALT                    ;INCORRCT STATUS
035264 012706 001000         1$:     MOV     #BUFF,SP        ;SET UP
035270 012767 035310 142506           MOV     #RETM,RTRAP5    ;SET UP
035276 012767 000357 142472           MOV     #357,CC         ;SET PRIORITY
035304 000277                         SCC                     ;SET CC
035306 004000                         JSR     %0,%0           ;TRAP
035310 026727 143462 000357  RETM:   CMP     BUFF-2,#357     ;COMPARES STATUS ON STACK
035316 001404                         BEQ     TS350
                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                      ;           WHICH FOLLOWS W/ 740            <====
035320 012742 001054                  MOV     #1054,-(R2)     ;MOVE TO MAILBOX #  *******  1054  *******
035324 005242                         INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
035326 000000                         HALT                    ;INCORRECT STATUS ON STACK,OR WRONG $TSTNM
                                                      ;  OR SEQUENCE ERROR
                             ;*******************************************************************************
                             ;TEST 350        TEST THAT ''NEW'' STATUS IS CORRECT
                             ;*******************************************************************************
035330 005212                TS350:  INC     (R2)            ;UPDATE TEST NUMBER
035332 022712 000350                  CMP     #350,(R2)       ;SEQUENCE ERROR?
035336 001105                         BNE     TS351-10        ;BR TO ERROR HALT ON SEQ ERROR
035340 012706 001000                  MOV     #BUFF,SP
035344 012767 035360 142432           MOV     #RETN,RTRAP5
035352 005067 142430                  CLR     RTRAP5+2        ;CLEAR FUTURE PRIORITY AND CC
035356 004000                         JSR     %0,%0
```

```
035360                       RETN:                              ;TEST FOR "C" CLEARED
035360  100004                     BPL     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 766             <====
035362  012742  001055             MOV     #1055,-(R2)          ;MOVE TO MAILBOX #  *******  1055  *******
035366  005242                     INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
035370  000000                     HALT                         ;C NOT CLEARED
035372                       1$:
035372  001004                     BNE     2$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 761             <====
035374  012742  001056             MOV     #1056,-(R2)          ;MOVE TO MAILBOX #  *******  1056  *******
035400  005242                     INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
035402  000000                     HALT                         ;Z NOT CLEARED
035404                       2$:
035404  102004                     BVC     3$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 754             <====
035406  012742  001057             MOV     #1057,-(R2)          ;MOVE TO MAILBOX #  *******  1057  *******
035412  005242                     INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
035414  000000                     HALT                         ;V NOT CLEARED
035416                       3$:
035416  103004                     BCC     4$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 747             <====
035420  012742  001060             MOV     #1060,-(R2)          ;MOVE TO MAILBOX #  *******  1060  *******
035424  005242                     INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
035426  000000                     HALT                         ;C NOT CLEARED
035430  016700  142342       4$:   MOV     CC,%0                ;TEMP STORAGE
035434  001404                     BEQ     5$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 740             <====
035436  012742  001061             MOV     #1061,-(R2)          ;MOVE TO MAILBOX #  *******  1061  *******
035442  005242                     INC     -(R2)                ;SET MSGTYP TO FATAL ERROR
035444  000000                     HALT                         ;PRIORITY NOT ZERO
035446  012706  001000       5$:   MOV     #BUFF,SP
035452  012767  035470  142324     MOV     #RETO,RTRAP5
035460  012767  000357  142320     MOV     #357,RTRAP5+2        ;SET NEW "CC" AND PRIORITY
035466  004000                     JSR     %0,%0                ;TRAP HERE
035470                       RETO:
035470  100404                     BMI     1$
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 722             <====
035472  012742  001062             MOV     #1062,-(R2)          ;MOVE TO MAILBOX #  *******  1062  *******
```

```
035476  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
035500  000000                   HALT                     ;N NOT SET
035502                   1$:
035502  001404                   BEQ     2$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 715             <====
035504  012742  001063           MOV     #1063,-(R2)      ;MOVE TO MAILBOX #  *******  1063  *******
035510  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
035512  000000                   HALT                     ;Z NOT SET
035514                   2$:
035514  102404                   BVS     3$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 710             <====
035516  012742  001064           MOV     #1064,-(R2)      ;MOVE TO MAILBOX #  *******  1064  *******
035522  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
035524  000000                   HALT                     ;V NOT SET
035526                   3$:
035526  103404                   BCS     4$
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 703             <====
035530  012742  001065           MOV     #1065,-(R2)      ;MOVE TO MAILBOX #  *******  1065  *******
035534  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
035536  000000                   HALT                     ;C NOT SET
035540  016700  142232   4$:     MOV     CC,%0
035544  022700  000357           CMP     #357,%0
035550  001404                   BEQ     TS351
                                                          ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                          ;           CONDITIONAL BRANCH INST. AND     <====
                                                          ;           REPLACE THE MOVE INSTRUCTION     <====
                                                          ;           WHICH FOLLOWS W/ 672             <====
035552  012742  001066           MOV     #1066,-(R2)      ;MOVE TO MAILBOX #  *******  1066  *******
035556  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
035560  000000                   HALT                     ;PRIORITY WAS CHANGED,OR WRONG $TSTNM
                                                          ;  OR SEQUENCE ERROR


                         ;*******************************************************************************
                         ;TEST 351          TEST THAT DECREMENT R6 TO A VALUE LESS THAN 400 TRAPS
                         ;*******************************************************************************
035562  005212           TS351:  INC     (R2)             ;UPDATE TEST NUMBER
035564  022712  000351           CMP     #351,(R2)        ;SEQUENCE ERROR?
035570  001006                   BNE     TS352-10         ;BR TO ERROR HALT ON SEQ ERROR
035572  012706  000150           MOV     #150,%6          ;R6 = 150
035576  012767  035616  142200   MOV     #TDEC1,4         ;STACK OVERFLOW TRAP POINTER
035604  005746                   TST     -(6)             ;WITH R6 = 150 SHOULD TRAP
035606  012742  001067           MOV     #1067,-(R2)      ;MOVE TO MAILBOX #  *******  1067  *******
035612  005242                   INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
035614  000000                   HALT                     ;SHOULD HAVE TRAPPED,OR WRONG $TSTNM
035616                   TDEC1:

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

```
                                     ;TEST 352          TEST FOR DECREMENT OF R6 ON OVERFLOW TRAP
                                     ;*************************************************************************************
035616  005212                       TS352:  INC     (R2)                    ;UPDATE TEST NUMBER
035620  022712  000352                       CMP     #352,(R2)               ;SEQUENCE ERROR?
035624  001011                               BNE     TS353-10                ;BR TO ERROR HALT ON SEQ ERROR
035626  012706  000150                       MOV     #150,%6                 ;R6 = 150
035632  012767  035642  142144               MOV     #TDEC2,4                ;TRAP POINTER
035640  005746                               TST     -(6)                    ;WITH R6 = 150 SHOULD TRAP
035642  020627  000142               TDEC2:  CMP     %6,#142                 ;DID R6 DECREMENT
035646  001404                               BEQ     TS353
                                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                             ;           CONDITIONAL BRANCH INST. AND     <====
                                                                             ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                             ;           WHICH FOLLOWS W/ 766             <====
035650  012742  001070                       MOV     #1070,-(R2)             ;MOVE TO MAILBOX #  *******  1070  *******
035654  005242                               INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
035656  000000                               HALT                            ;R6 NOT = 142,OR WRONG $TSTNM
                                                                             ;  OR SEQUENCE ERROR


                                     ;*************************************************************************************
                                     ;TEST 353          TEST DIFFERENT TYPES OF OVERFLOW
                                     ;*************************************************************************************
035660  005212                       TS353:  INC     (R2)                    ;UPDATE TEST NUMBER
035662  022712  000353                       CMP     #353,(R2)               ;SEQUENCE ERROR?
035666  001041                               BNE     TS354-10                ;BR TO ERROR HALT ON SEQ ERROR
035670  012706  000150                       MOV     #150,%6
035674  005067  142246                       CLR     146                     ;STATUS WORD OF LOC 10
035700  012767  035710  142076               MOV     #TDEC3,4                ;RETURN TO LOC 4
035706  005246                               INC     -(6)
035710  005767  142232               TDEC3:  TST     146
035714  001004                               BNE     1$
                                                                             ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                             ;           CONDITIONAL BRANCH INST. AND     <====
                                                                             ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                             ;           WHICH FOLLOWS W/ 764             <====
035716  012742  001071                       MOV     #1071,-(R2)             ;MOVE TO MAILBOX #  *******  1071  *******
035722  005242                               INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
035724  000000                               HALT                            ;INCREMENT OPERATION NOT INHIBITED
035726  012705  001000               1$:     MOV     #1000,%5
035732  012706  000400                       MOV     #400,%6
035736  012767  035756  142040               MOV     #TDEC4,4
035744  124645                               CMPB    -(6),-(5)
035746  012742  001072                       MOV     #1072,-(R2)             ;MOVE TO MAILBOX #  *******  1072  *******
035752  005242                               INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
035754  000000                               HALT                            ;STACK = 400 AND DECREMENTED, SHOULD TRAP
035756  012706  000400               TDEC4:  MOV     #400,%6
035762  012767  036002  142014               MOV     #TDEC7,4
035770  134546                               BITB    -(5),-(6)
035772                               TDEC6:
035772  012742  001073                       MOV     #1073,-(R2)             ;MOVE TO MAILBOX #  *******  1073  *******
035776  005242                               INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036000  000000                               HALT                            ;NO STACK OVERFLOW,OR WRONG $TSTNM
036002                               TDEC7:


                                     ;*************************************************************************************
                                     ;TEST 354          TEST THAT AN 77 CAUSES AN OVERFLOW TRAP
```

```
                                    ;*******************************************************************************
036002  005212                      TS354:  INC     (R2)                    ;UPDATE TEST NUMBER
036004  022712  000354                      CMP     #354,(R2)               ;SEQUENCE ERROR?
036010  001011                              BNE     VDEC2                   ;BR TO ERROR HALT ON SEQ ERROR
036012  012706  000400                      MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036016  012767  036034  141764              MOV     #VDEC2,10               ;SET UP 77 VECTOR
036024  012767  036044  141752              MOV     #VDEC1,4                ;SET UP OVERFLOW VECTOR
036032  000077                              77                              ;THIS TRAP SHOULD CAUSE OVERFLOW
036034                              VDEC2:
036034  012742  001074                      MOV     #1074,-(R2)             ;MOVE TO MAILBOX #  *******  1074  *******
036040  005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036042  000000                              HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036044  012767  000012  141736      VDEC1:  MOV     #10+2,10
                                    ;*******************************************************************************
                                    ;TEST 355       TEST THAT AN IOT CAUSES AN OVERFLOW TRAP
                                    ;*******************************************************************************
036052  005212                      TS355:  INC     (R2)                    ;UPDATE TEST NUMBER
036054  022712  000355                      CMP     #355,(R2)               ;SEQUENCE ERROR?
036060  001011                              BNE     VDEC4                   ;BR TO ERROR HALT ON SEQ ERROR
036062  012706  000400                      MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036066  012767  036104  141724              MOV     #VDEC4,20               ;SET UP IOT VECTOR
036074  012767  036114  141702              MOV     #VDEC3,4                ;SET UP OVERFLOW VECTOR
036102  000004                              IOT                             ;THIS TRAP SHOULD CAUSE OVERFLOW
036104                              VDEC4:
036104  012742  001075                      MOV     #1075,-(R2)             ;MOVE TO MAILBOX #  *******  1075  *******
036110  005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036112  000000                              HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036114  012767  000022  141676      VDEC3:  MOV     #20+2,20
                                    ;*******************************************************************************
                                    ;TEST 356       TEST THAT AN EMT CAUSES AN OVERFLOW TRAP
                                    ;*******************************************************************************
036122  005212                      TS356:  INC     (R2)                    ;UPDATE TEST NUMBER
036124  022712  000356                      CMP     #356,(R2)               ;SEQUENCE ERROR?
036130  001011                              BNE     VDEC6                   ;BR TO ERROR HALT ON SEQ ERROR
036132  012706  000400                      MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036136  012767  036154  141664              MOV     #VDEC6,30               ;SET UP EMT VECTOR
036144  012767  036164  141632              MOV     #VDEC5,4                ;SET UP OVERFLOW VECTOR
036152  104000                              EMT                             ;THIS TRAP SHOULD CAUSE OVERFLOW
036154                              VDEC6:
036154  012742  001076                      MOV     #1076,-(R2)             ;MOVE TO MAILBOX #  *******  1076  *******
036160  005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036162  000000                              HALT                            ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036164  012767  000032  141636      VDEC5:  MOV     #30+2,30
                                    ;*******************************************************************************
                                    ;TEST 357       TEST THAT AN TRAP CAUSES AN OVERFLOW TRAP
                                    ;*******************************************************************************
036172  005212                      TS357:  INC     (R2)                    ;UPDATE TEST NUMBER
036174  022712  000357                      CMP     #357,(R2)               ;SEQUENCE ERROR?
036200  001011                              BNE     VDEC8                   ;BR TO ERROR HALT ON SEQ ERROR
036202  012706  000400                      MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
036206  012767  036224  141620              MOV     #VDEC8,34               ;SET UP TRAP VECTOR
036214  012767  036234  141562              MOV     #VDEC7,4                ;SET UP OVERFLOW VECTOR
036222  104400                              TRAP                            ;THIS TRAP SHOULD CAUSE OVERFLOW
036224                              VDEC8:
036224  012742  001077                      MOV     #1077,-(R2)             ;MOVE TO MAILBOX #  *******  1077  *******
036230  005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
```

```
036232  000000                           HALT                      ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036234  012767  000036  141572  VDEC7:   MOV     #34+2,34
                                ;*******************************************************************************
                                ;TEST 360        TEST THAT AN TRT CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036242  005212                  TS360:   INC     (R2)              ;UPDATE TEST NUMBER
036244  022712  000360                   CMP     #360,(R2)         ;SEQUENCE ERROR?
036250  001011                           BNE     VDEC10            ;BR TO ERROR HALT ON SEQ ERROR
036252  012706  000400                   MOV     #400,%6           ;SET UP STACK TO OVERFLOW
036256  012767  036274  141530           MOV     #VDEC10,14        ;SET UP TRT VECTOR
036264  012767  036304  141512           MOV     #VDEC9,4          ;SET UP OVERFLOW VECTOR
036272  000003                           TRT                       ;THIS TRAP SHOULD CAUSE OVERFLOW
036274                          VDEC10:
036274  012742  001100                   MOV     #1100,-(R2)       ;MOVE TO MAILBOX #  *******  1100  *******
036300  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
036302  000000                           HALT                      ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036304  012767  000016  141502  VDEC9:   MOV     #14+2,14
                                ;*******************************************************************************
                                ;TEST 361        TEST THAT AN ILLA CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036312  005212                  TS361:   INC     (R2)              ;UPDATE TEST NUMBER
036314  022712  000361                   CMP     #361,(R2)         ;SEQUENCE ERROR?
036320  001011                           BNE     VDEC11            ;BR TO ERROR HALT ON SEQ ERROR
036322  012706  000400                   MOV     #400,%6           ;SET UP STACK TO OVERFLOW
036326  012767  036344  141454           MOV     #VDEC11,10        ;SET UP ILLA VECTOR
036334  012767  036354  141442           MOV     #VDEC12,4         ;SET UP OVERFLOW VECTOR
036342  004700                           ILLA                      ;THIS TRAP SHOULD CAUSE OVERFLOW
036344                          VDEC11:
036344  012742  001101                   MOV     #1101,-(R2)       ;MOVE TO MAILBOX #  *******  1101  *******
036350  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
036352  000000                           HALT                      ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
036354  012767  000012  141426  VDEC12:  MOV     #10+2,10
036362  020627  000370                   CMP     %6,#370           ;STACK PUSHED FOUR WORDS?
036366  001404                           BEQ     TS362
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                   ;           CONDITIONAL BRANCH INST. AND   <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                   ;           WHICH FOLLOWS W/ 754           <====
036370  012742  001102                   MOV     #1102,-(R2)       ;MOVE TO MAILBOX #  *******  1102  *******
036374  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
036376  000000                           HALT                      ;TRAP OVERFLOW DID NOT OCCUR
                                                                   ;  OR SEQUENCE ERROR
                                ;*******************************************************************************
                                ;TEST 362        TEST THAT AN ILLB CAUSES AN OVERFLOW TRAP
                                ;*******************************************************************************
036400  005212                  TS362:   INC     (R2)              ;UPDATE TEST NUMBER
036402  022712  000362                   CMP     #362,(R2)         ;SEQUENCE ERROR?
036406  001011                           BNE     VDEC13            ;BR TO ERROR HALT ON SEQ ERROR
036410  012706  000400                   MOV     #400,%6           ;SET UP STACK TO OVERFLOW
036414  012767  036432  141366           MOV     #VDEC13,10        ;SET UP ILLB VECTOR
036422  012767  036442  141354           MOV     #VDEC14,4         ;SET UP OVERFLOW VECTOR
036430  000100                           ILLB                      ;THIS TRAP SHOULD CAUSE OVERFLOW
036432                          VDEC13:
036432  012742  001103                   MOV     #1103,-(R2)       ;MOVE TO MAILBOX #  *******  1103  *******
036436  005242                           INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
036440  000000                           HALT                      ;TRAP FLAG OVERFLOW DID NOT OCCUR,OR WRONG $TSTNM
```

```
036442 012767 000012 141340 VDEC14: MOV     #10+2,10

                                   ;*******************************************************************************
                                   ;TEST 363          TEST FOR FALSE OVERFLOW TRAP
                                   ;*******************************************************************************
036450 005212                      TS363:  INC     (R2)                    ;UPDATE TEST NUMBER
036452 022712 000363                       CMP     #363,(R2)               ;SEQUENCE ERROR?
036456 001023                              BNE     FOVER                   ;BR TO ERROR HALT ON SEQ ERROR

036460 012767 036526 141316                MOV     #FOVER,4                ;SET UP OVERFLOW POINTER
036466 012706 001002                       MOV     #1002,%6
036472 005746                              TST     -(6)                    ;SHOULD NOT OVERFLOW
036474 012706 002002                       MOV     #2002,%6
036500 005746                              TST     -(6)                    ;SHOULD NOT OVERFLOW
036502 012706 004002                       MOV     #4002,%6
036506 005746                              TST     -(6)                    ;SHOULD NOT OVERFLOW
036510 012706 010002                       MOV     #10002,%6
036514 005746                              TST     -(6)
036516 012706 020000                       MOV     #20000,%6               ;SHOULD NOT OVERFLOW
036522 005746                              TST     -(6)
036524 000404                              BR      STP
                                                                   ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                   ;           CONDITIONAL BRANCH INST. AND     <====
                                                                   ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                   ;           WHICH FOLLOWS W/ 754             <====
036526                             FOVER:
036526 012742 001104                       MOV     #1104,-(R2)             ;MOVE TO MAILBOX #  *******  1104  *******
036532 005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036534 000000                              HALT                            ;IT OVERFLOWED,OR WRONG $TSTNM

036536 012767 000006 141240 STP:   MOV     #6,4
036544 005067 141236                       CLR     6

                                   ;*******************************************************************************
                                   ;TEST 364          TEST THAT BIT 4 PSW WILL CAUSE A TRAP TO 14
                                   ;*******************************************************************************
036550 005212                      TS364:  INC     (R2)                    ;UPDATE TEST NUMBER
036552 022712 000364                       CMP     #364,(R2)               ;SEQUENCE ERROR?
036556 001013                              BNE     TS365-10                ;BR TO ERROR HALT ON SEQ ERROR
036560 012706 001000                       MOV     #BUFF,SP
036564 012767 036616 141222                MOV     #RETAT,RTRAP4           ;SET UP TO TRAP TO 14
036572 012746 000020                       MOV     #20,-(SP)               ;PUSH T BIT
036576 012746 036604                       MOV     #.+6,-(SP)              ;PUSH PC
036602 000002                              RTI                             ;SET T BIT
036604 000240                              NOP                             ;TRAP HERE
036606 012742 001105                       MOV     #1105,-(R2)             ;MOVE TO MAILBOX #  *******  1105  *******
036612 005242                              INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
036614 000000                              HALT                            ;TRACE BIT DID NOT TRAP!,OR WRONG $TESTN
036616                             RETAT:

                                   ;*******************************************************************************
                                   ;TEST 365          TEST  STACK POINTER DECREMENTS
                                   ;*******************************************************************************
036616 005212                      TS365:  INC     (R2)                    ;UPDATE TEST NUMBER
036620 022712 000365                       CMP     #365,(R2)               ;SEQUENCE ERROR?
036624 001022                              BNE     TS366-10                ;BR TO ERROR HALT ON SEQ ERROR
036626 012706 001000                       MOV     #BUFF,SP
036632 012767 036664 141154                MOV     #RETBT,RTRAP4
```

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036640  012746  000020                    MOV     #20,-(SP)          ;PUSH T BIT
036644  012746  036652                    MOV     #.+6,-(SP)         ;PUSH PC
036650  000002                            RTI                        ;SET T BIT
036652  000240                            NOP                        ;TRAP HERE
036654  012742  001106                    MOV     #1106,-(R2)        ;MOVE TO MAILBOX #  *******  1106  *******
036660  005242                            INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
036662  000000                            HALT                       ;TRACE BIT DID NOT TRAP!
036664  020627  000774           RETBT:   CMP     SP,#BUFF-4
036670  001404                            BEQ     TS366
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                     ;           WHICH FOLLOWS W/ 755            <====
036672  012742  001107                    MOV     #1107,-(R2)        ;MOVE TO MAILBOX #  *******  1107  *******
036676  005242                            INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
036700  000000                            HALT                       ;STACK POINTER WAS NOT PUSHED BY TRAP,OR WRONG $TESTN
                                                                     ;  OR SEQUENCE ERROR
                                 ;*****************************************************************************
                                 ;TEST 366          TEST  FOR PROPER PC ON STACK
                                 ;*****************************************************************************
036702  005212                   TS366:   INC     (R2)               ;UPDATE TEST NUMBER
036704  022712  000366                    CMP     #366,(R2)          ;SEQUENCE ERROR?
036710  001016                            BNE     TS367-10           ;BR TO ERROR HALT ON SEQ ERROR
036712  012706  001000                    MOV     #BUFF,SP
036716  012767  036736  141070            MOV     #RETCT,RTRAP4
036724  012746  000020                    MOV     #20,-(SP)          ;PUSH T BIT
036730  012746  036736                    MOV     #.+6,-(SP)         ;PUSH PC
036734  000002                            RTI                        ;SET T BIT
                                                                     ;TRAP HERE
036736  022767  036736  142030   RETCT:   CMP     #.,BUFF-4
036744  001404                            BEQ     TS367
                                                                     ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                     ;           CONDITIONAL BRANCH INST. AND    <====
                                                                     ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                     ;           WHICH FOLLOWS W/ 761            <====
036746  012742  001110                    MOV     #1110,-(R2)        ;MOVE TO MAILBOX #  *******  1110  *******
036752  005242                            INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
036754  000000                            HALT                       ;CORRECT PC WAS NOT SAVED ON STACK,OR WRONG $TESTN
                                                                     ;  OR SEQUENCE ERROR



                                 ;*****************************************************************************
                                 ;TEST 367          TEST  THAT RTT POPS T- BIT
                                 ;*****************************************************************************
036756  005212                   TS367:   INC     (R2)               ;UPDATE TEST NUMBER
036760  022712  000367                    CMP     #367,(R2)          ;SEQUENCE ERROR?
036764  001015                            BNE     TS370-10           ;BR TO ERROR HALT ON SEQ ERROR

036766  012706  001000                    MOV     #BUFF,SP
036772  005001                            CLR     R1                 ;CLEAR R1
036774  012746  000020                    MOV     #20,-(SP)
037000  012746  037014                    MOV     #RTT1,-(SP)
037004  012767  037030  141002            MOV     #RTT2,14
037012  000006                            RTT
037014  000240                   RTT1:    NOP
037016  001404                            BEQ     TS370
```

```
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 762             <====
037020  012742  001111                  MOV     #1111,-(R2)      ;MOVE TO MAILBOX #  *******  1111  *******
037024  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037026  000000                          HALT                     ;T-BIT DID NOT TRAP,OR WRONG $TESTN
                                                                 ;  OR SEQUENCE ERROR

037030                          RTT2:
                                ;*******************************************************************************
                                ;TEST 370        TEST  THAT RTT ALLOWS ONE INST. BEFORE TRAP
                                ;*******************************************************************************
037030  005212                  TS370:  INC     (R2)             ;UPDATE TEST NUMBER
037032  022712  000370                  CMP     #370,(R2)        ;SEQUENCE ERROR?
037036  001030                          BNE     TS371-10         ;BR TO ERROR HALT ON SEQ ERROR
037040  012705  177777                  MOV     #177777,%5
037044  012706  001000          RTT5:   MOV     #BUFF,SP
037050  012746  000020                  MOV     #20,-(SP)
037054  012746  037072                  MOV     #RTT3,-(SP)
037060  012767  037110  140726          MOV     #RTT4,14
037066  005001                          CLR     R1               ;CLEAR R0
037070  000006                          RTT                      ;SET T-BIT
037072  005201                  RTT3:   INC     R1
037074  005205                          INC     %5
037076  001762                          BEQ     RTT5             ;DO THIS TEST NO MORE THAN 2 TIMES
037100  012742  001112                  MOV     #1112,-(R2)      ;MOVE TO MAILBOX #  *******  1112  *******
037104  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037106  000000                          HALT                     ;DID NOT TRAP
037110  005301                  RTT4:   DEC     R1               ;SEE IF RTT ALLOWS 1 INST.
037112  001406                          BEQ     RTT6
037114  005205                          INC     %5               ;DO THIS TEST NO MORE THAN TWO TIMES
037116  001752                          BEQ     RTT5
                                                                 ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                 ;           CONDITIONAL BRANCH INST. AND     <====
                                                                 ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                 ;           WHICH FOLLOWS W/ 747             <====
037120  012742  001113                  MOV     #1113,-(R2)      ;MOVE TO MAILBOX #  *******  1113  *******
037124  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
037126  000000                          HALT                     ;RTT DID NOT ALLOW 1 INST.,OR WRONG $TESTN
037130                          RTT6:
                                ;*******************************************************************************
                                ;TEST 371        TEST  THAT RTI DOES NOT ALLOW 1 INST.
                                ;*******************************************************************************
037130  005212                  TS371:  INC     (R2)             ;UPDATE TEST NUMBER
037132  022712  000371                  CMP     #371,(R2)        ;SEQUENCE ERROR?
037136  001022                          BNE     TS372-10         ;BR TO ERROR HALT ON SEQ ERROR
037140  012706  001000                  MOV     #BUFF,SP
037144  012746  000020                  MOV     #20,-(SP)
037150  012746  037166                  MOV     #RTI1,-(SP)
037154  012767  037200  140632          MOV     #RTI2,14
037162  005001                          CLR     R1
037164  000002                          RTI                      ;SET T-BIT
037166  005201                  RTI1:   INC     R1               ;RTI SHOULD NOT ALLOW THIS
037170  012742  001114                  MOV     #1114,-(R2)      ;MOVE TO MAILBOX #  *******  1114  *******
037174  005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
```

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037176  000000                          HALT                    ;T- BIT DID NOT CAUSE TRAP
037200  005701                  RTI2:   TST     R1
                                                                ;RTI SHOULD NOT ALLOW 1 INST. BEFORE TRAP
037202  001404                          BEQ     TS372
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                ;           WHICH FOLLOWS W/ 755             <====
037204  012742  001115                  MOV     #1115,-(R2)     ;MOVE TO MAILBOX #  *******  1115  *******
037210  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037212  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
                                ;*******************************************************************************
037214  005212                  TS372:  INC     (R2)            ;UPDATE TEST NUMBER
037216  022712  000372                  CMP     #372,(R2)       ;SEQUENCE ERROR?
037222  001026                          BNE     BR70            ;BR TO ERROR HALT ON SEQ ERROR

037224  012706  001000                  MOV     #BUFF,%6
037230  012767  037270  140556          MOV     #TRACE,14       ;TRACE TRAP
037236  005027  000016                  CLR     #16
037242  005027  000022                  CLR     #22
037246  012767  037310  140544          MOV     #TONT1,20       ;IOT TRAP
037254  012746  000020                  MOV     #20,-(SP)       ;PUSH T BIT
037260  012746  037266                  MOV     #.+6,-(SP)      ;PUSH PC
037264  000006                          RTT
037266  000004                          IOT                     ;TRAP, NEW CC HAVE TRACE RESET
037270                          TRACE:
037270  012742  001116                  MOV     #1116,-(R2)     ;MOVE TO MAILBOX #  *******  1116  *******
037274  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037276  000000                          HALT                    ;TRACE TRAP WAS NOT INHIBITED
037300                          BR70:
037300  012742  001117                  MOV     #1117,-(R2)     ;MOVE TO MAILBOX #  *******  1117  *******
037304  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037306  000000                          HALT                    ;WRONG TSTNM,OR WRONG $TSTNM
037310  012767  000016  140476  TONT1:  MOV     #16,14
037316  012767  000022  140474          MOV     #22,20
                                ;*******************************************************************************
                                ;TEST 373       TEST THAT THE TRACE BIT IS SAVED IN THE STACK
                                ;*******************************************************************************
037324  005212                  TS373:  INC     (R2)            ;UPDATE TEST NUMBER
037326  022712  000373                  CMP     #373,(R2)       ;SEQUENCE ERROR?
037332  001020                          BNE     STP3            ;BR TO ERROR HALT ON SEQ ERROR
037334  012706  001000                  MOV     #BUFF,%6        ;SET UP STACK POINTER
037340  012767  037364  140446          MOV     #TRC1,14        ;TRACE TRAP RETURN
037346  005067  140444                  CLR     16
037352  012746  000020                  MOV     #20,-(SP)       ;SET THE T BIT
037356  012746  037364                  MOV     #TRC1,-(SP)
037362  000002                          RTI
037364  036727  141406  000020  TRC1:   BIT     BUFF-2,#20      ;CHECK FOR T BIT ON STACK
037372  001004                          BNE     STP3D
                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
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                                                        ;               WHICH FOLLOWS W/ 757            <====
037374                                  STP3:
037374  012742  001120                          MOV     #1120,-(R2)     ;MOVE TO MAILBOX #  *******  1120  *******
037400  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037402  000000                                  HALT                    ;T BIT NOT SAVED ON THE STACK,OR WRONG $TSTNM
037404  012767  000016  140402  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
                                        ;*************************************************************************
037412  005212                          TS374:  INC     (R2)            ;UPDATE TEST NUMBER
037414  022712  000374                          CMP     #374,(R2)       ;SEQUENCE ERROR?
037420  001150                                  BNE     TS375-10        ;BR TO ERROR HALT ON SEQ ERROR
037422  042737  010000  037472                  BIC     #10000,@#HICORE ;SET HIGHT CORE LIMIT TO 160000
037430  032737  000002  000322                  BIT     #2,@#$SWREG     ;CHECK IF BIT 1 IS SET
037436  001403                                  BEQ     1$              ;BRANCH IF IT IS, LEAVE LIMIT=160000
037440  052737  010000  037472                  BIS     #10000,@#HICORE ;SET UPPER CORE LIMIT TO 30K (170000)
037446  005000                          1$:     CLR     R0              ;
037450  005067  140332                          CLR     6               ;
037454  012767  037562  140322                  MOV     #ATRAP,4        ;SET UP ADDRESS TRAP ENTRANCE
037462  012706  001000                          MOV     #BUFF,SP        ;SET STACK POINTER
037466  105720                          NOR:    TSTB    (0)+            ;IF OUTSIDE OF CORE, TRAP TO 4
037470  020027                                  CMP     R0,(PC)+        ;IS POINTER INSIDE 28K (30K) CORE
037472  160000                          HICORE: .WORD   160000          ;MAY BE CHANGED TO 170000 IF 30K
037474  103774                                  BLO     NOR             ;TEST THE REST OF CORE
037476  012737  037520  000004                  MOV     #R0TRAP,@#4     ;SET UP NEW VECTOR POINTER
037504  105737  177700                          TSTB    @#177700        ;SHOULD CAUSE A TRAP
037510                                  TRPADR:
037510  012742  001121                          MOV     #1121,-(R2)     ;MOVE TO MAILBOX #  *******  1121  *******
037514  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037516  000000                                  HALT                    ;SHOULD HAVE TRAPED

                                        ;TRAP TO HERE IF FORCING TRAP BY TESTING 177700
037520  106767  140252                  R0TRAP: MFPS    STATUS
037524  005767  140246                          TST     STATUS          ;TEST PSW
037530  001404                                  BEQ     1$
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
                                                        ;               REPLACE THE MOVE INSTRUCTION    <====
                                                        ;               WHICH FOLLOWS W/ 733            <====
037532  012742  001122                          MOV     #1122,-(R2)     ;MOVE TO MAILBOX #  *******  1122  *******
037536  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
037540  000000                                  HALT                    ;NEW PSW SHOULD HAVE BEEN ZERO
037542  026727  141226  037510  1$:     CMP     BUFF-4,#TRPADR  ;TEST OLD PC AT STACK
037550  001453                                  BEQ     TRAPB
                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS      <====
                                                        ;               CONDITIONAL BRANCH INST. AND    <====
```

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                                                                  ;             REPLACE THE MOVE INSTRUCTION   <====
                                                                  ;             WHICH FOLLOWS W/ 723           <====
037552 012742 001123                   MOV     #1123,-(R2)        ;MOVE TO MAILBOX #  *******  1123  *******
037556 005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
037560 000000                          HALT                       ;OLD PC WAS NOT SAVED
                               ;RETURN HERE ON AN ADDRESS TRAP FROM MEMORY BELOW 28K (OR 30K)
037562 005300                  ATRAP:  DEC     R0                 ;
037564 010067 000032                   MOV     R0,CORH            ;MOVE THE FIRST NXM LOCATION IN CORH
                               ;THIS ROUTINE DOES NXM TRAPS UNTIL IT FINDS AN EXISTENT MEMORY LOCATION
037570 013700 037472                   MOV     @#HICORE,R0        ;SET UP THE HIGHEST MEM LOCATION
037574 005300                          DEC     R0                 ;MAKE 1 LESS THAN THE HIGHEST CORE BOUNDARY
037576 000402                          BR      NOSUB              ;DON'T SUBTRACT 1K FIRST TIME
037600 162700 001000           CTRAP:  SUB     #1000,R0           ;SUBTRACT 1K OCTAL BYTE FROM ADDRESS
                                                                  ;TO SPEED UP TESTING
037604 012767 037636 140172    NOSUB:  MOV     #BTRAP,4           ;SET UP THE VECTOR
037612 012706 001000                   MOV     #BUFF,SP
037616 005710                          TST     (R0)               ;DOES THIS MEMORY EXIST?
                                                                  ;IF NXM, TRAP TO BTRAP
037620 020027                  DTRAP1: CMP     R0,(PC)+           ;IF EXISTS, IS THIS THE SAME TRAP THAT CAUSED
                                                                  ;TRAP TO ATRAP
037622 000000                  CORH:   .WORD   0
037624 101425                          BLOS    TRAPB
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 675             <====
037626 012742 001124                   MOV     #1124,-(R2)        ;MOVE TO MAILBOX #  *******  1124  *******
037632 005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
037634 000000                          HALT                       ;CONTENTS OF R0 SHOULD BE LESS THAN OR EQUAL  TO CORH
                                                                  ;IF THIS COMPARISON FAILS IT MEANS
                                                                  ;THAT SOME LEGAL ADDRESS TRAPPED, OR
                                                                  ;THAT AN ILLEGAL ADDRESS DID NOT TRAP
037636 106767 140134           BTRAP:  MFPS    STATUS
037642 005767 140130                   TST     STATUS
037646 001404                          BEQ     1$
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 664             <====
037650 012742 001125                   MOV     #1125,-(R2)        ;MOVE TO MAILBOX #  *******  1125  *******
037654 005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
037656 000000                          HALT                       ;NEW PSW SHOULD HAVE BEEN ZERO
037660 026727 141110 037620    1$:     CMP     BUFF-4,#DTRAP1     ;CHECK IF TRAP PC IS OK
037666 001744                          BEQ     CTRAP
                                                                  ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                  ;           CONDITIONAL BRANCH INST. AND     <====
                                                                  ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                  ;           WHICH FOLLOWS W/ 654             <====
037670                         AUTO1:
037670 012742 001126                   MOV     #1126,-(R2)        ;MOVE TO MAILBOX #  *******  1126  *******
037674 005242                          INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
037676 000000                          HALT                       ;OLD PC WAS NOT SAVED OR WRONG $TESTN
037700 012767 000006 140076    TRAPB:  MOV     #6,4               ;RESET TRAP CATCHER
037706 005067 140074                   CLR     6                  ;RESET TRAP CATCHER
```

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                                        ;THIS ROUTINE WILL FIGURE OUT IF YOU HAVE A DL11W
037712  005067  000020                          CLR     PROFTE
037716  012706  001000                          MOV     #BUFF,SP                ;SET UP THE STACK POINTER
037722  012767  037740  140054                  MOV     #DL11W,4                ;SET UP THE TRAP VECTOR
037730  005767  137630                          TST     TPS                     ;TEST THE PUNCH STATUS REGISTER
037734  000403                                  BR      DL11W1
037736  000000                          PROFTE: 000000
037740  005267  177772                  DL11W:  INC     PROFTE                  ;INCR IF NO DL11W
037744  012767  000006  140032          DL11W1: MOV     #6,4

037752                                  SKP104:
                                        ;*****************************************************************************
                                        ;TEST 375           TEST THAT A TTY INTERRUPT CAUSES AN OVERFLOW TRAP
                                        ;*****************************************************************************
037752  005212                          TS375:  INC     (R2)                    ;UPDATE TEST NUMBER
037754  022712  000375                          CMP     #375,(R2)               ;SEQUENCE ERROR?
037760  001037                                  BNE     TDEC8                   ;BR TO ERROR HALT ON SEQ ERROR
037762  005767  177750                          TST     PROFTE
037766  001047                                  BNE     R7TRX
037770  122767  000001  140322                  CMPB    #APTENV,$ENV                    ;RUNING IN APT MODE?
037776  001003                                  BNE     2$                              ;IF NOT, DO THIS TEST
040000  005767  140302                          TST     $PASS                           ;IS THIS THE FIRST PASS?
040004  001040                                  BNE     R7TRX                           ;IF NOT FIRST PASS, SKIP TEST
040006                                  2$:
040006  000005                                  RESET                           ;
040010  012767  000340  137760                  MOV     #340,STATUS             ;LOCK OUT INTERRUPT
040016  012706  000400                          MOV     #400,%6                 ;SET UP STACK TO OVERFLOW
040022  012767  040070  137754                  MOV     #TDEC77,4               ;SET UP OVERFLOW TRAP
040030  012767  040060  140026                  MOV     #TDEC8,64               ;SET UP INTERRUPT VECTOR
040036  012767  000100  137520                  MOV     #100,TTCSR              ;SET INTERRUPT ENABLE
040044  005067  137726                          CLR     STATUS                  ;ALLOW INTERRUPT TO OCCUR
040050  012742  001127                          MOV     #1127,-(R2)             ;MOVE TO MAILBOX #  *******  1127  *******
040054  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
040056  000000                                  HALT                            ;NO INTERRUPT OCCURRED
040060                                  TDEC8:
040060  012742  001130                          MOV     #1130,-(R2)             ;MOVE TO MAILBOX #  *******  1130  *******
040064  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
040066  000000                                  HALT                            ;OVERFLOW TRAP DID NOT OCCUR OR WRONG $TSTNM
040070  005067  137470                  TDEC77: CLR     TTCSR                   ;CLEAR INTERRUPT ENABLE
040074  012767  000006  137702                  MOV     #6,4
040102  005067  137700                          CLR     6
040106                                  R7TRX:
                                        ;*****************************************************************************
                                        ;TEST 376           TEST THAT A PENDING INTERRUPT OCCURS BEFORE TRAP
                                        ;*****************************************************************************
040106  005212                          TS376:  INC     (R2)                    ;UPDATE TEST NUMBER
040110  022712  000376                          CMP     #376,(R2)               ;SEQUENCE ERROR?
040114  001045                                  BNE     BR71                    ;BR TO ERROR HALT ON SEQ ERROR
040116  005767  177614                          TST     PROFTE
040122  001053                                  BNE     NODL
040124  122767  000001  140166                  CMPB    #APTENV,$ENV                    ;RUNING IN APT MODE?
040132  001003                                  BNE     2$                              ;IF NOT, DO THIS TEST
040134  005767  140146                          TST     $PASS                           ;IS THIS THE FIRST PASS?
040140  001044                                  BNE     NODL                            ;IF NOT FIRST PASS, SKIP TEST
040142                                  2$:
040142  012706  001000                          MOV     #BUFF,%6
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040146 012767 000340 137622            MOV     #340,STATUS      ;SET TO A HIGH PRIORITY LEVEL
040154 012767 040220 137702            MOV     #TR0,64
040162 012767 000100 137374            MOV     #100,TTCSR       ;INTERRUPT FOR TTY PUNCH/PRINTER
040170 012767 040230 137636            MOV     #BR71,34         ;TRAP VECTOR
040176 012767 040240 137660            MOV     #TR2,64          ;TTY VECTOR
040204 012767 000340 137624            MOV     #340,36          ;IF TRAP TRAPS, MOVE 340 TO PRIORITY
040212 005067 137560                   CLR     STATUS           ;SHOULD INTERRUPT AT END OF CLR INST
040216 104400                          TRAP                     ;TTY INTERRUPT SHOULD OVERRIDE TRAP
040220                         TR0:
040220 012742 001131                   MOV     #1131,-(R2)      ;MOVE TO MAILBOX #  *******  1131  *******
040224 005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
040226 000000                          HALT                     ;TTY SHOULDN'T HAVE INTERRUPTED
040230                         BR71:
040230 012742 001132                   MOV     #1132,-(R2)      ;MOVE TO MAILBOX #  *******  1132  *******
040234 005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
040236 000000                          HALT                     ;TRAP OCCURRED FIRST,OR WRONG $TSTNM
040240 005067 137572           TR2:    CLR     36
040244 042767 000100 137312            BIC     #100,TTCSR
040252                         NODL:
                               ;*******************************************************************************
                               ;TEST 377        TEST THAT A PENDING INTERRUPT, INTERRUPTS BETWEEN TRAPS
                               ;*******************************************************************************
040252 005212                  TS377:  INC     (R2)             ;UPDATE TEST NUMBER
040254 022712 000377                   CMP     #377,(R2)        ;SEQUENCE ERROR?
040260 001043                          BNE     TR5              ;BR TO ERROR HALT ON SEQ ERROR
040262 005767 177450                   TST     PROFTE
040266 001063                          BNE     NODL1
040270 122767 000001 140022            CMPB    #APTENV,$ENV             ;RUNING IN APT MODE?
040276 001003                          BNE     2$                       ;IF NOT, DO THIS TEST
040300 005767 140002                   TST     $PASS                    ;IS THIS THE FIRST PASS?
040304 001054                          BNE     NODL1                    ;IF NOT FIRST PASS, SKIP TEST
040306                         2$:
040306 012706 001000                   MOV     #BUFF,%6
040312 012767 000340 137456            MOV     #340,STATUS
040320 012767 000100 137236            MOV     #100,TTCSR
040326 012767 040366 137500            MOV     #TR3,34          ;TRAP
040334 012767 040400 137522            MOV     #TR4,64          ;TTY OUTPUT
040342 012767 000340 137516            MOV     #340,66          ;TTY OUTPUT PRIORITY
040350 012767 040370 137442            MOV     #TR5,20          ;IOT
040356 012767 000340 137436            MOV     #340,22          ;IOT PRIORITY
040364 104400                          TRAP                     ;THE ACT OF TRAPPING LOWER PRIORITY
040366 000004                  TR3:    IOT                      ;INTERRUPT SHOULD OCCUR IN PLACE OF IOT TRAP
040370                         TR5:
040370 012742 001133                   MOV     #1133,-(R2)      ;MOVE TO MAILBOX #  *******  1133  *******
040374 005242                          INC     -(R2)            ;SET MSGTYP TO FATAL ERROR
040376 000000                          HALT                     ;NO INTERRUPT BETWEEN TRAPS,OR WRONG $TSTNM
040400 005067 137416           TR4:    CLR     22               ;CLR IOT PRIORITY
040404 005067 137456                   CLR     66
040410 012767 000036 137416            MOV     #36,34
040416 012767 000066 137440            MOV     #66,64
040424 012767 000022 137366            MOV     #22,20
040432 005067 137126                   CLR     TTCSR
040436                         NODL1:

                               ;*******************************************************************************
                               ;TEST 400        TEST THAT "RESET" GOES TO OUTSIDE WORLD
```

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                                      ;*******************************************************************************
040436  005212                        TS400:  INC     (R2)            ;UPDATE TEST NUMBER
040440  022712  000400                        CMP     #400,(R2)       ;SEQUENCE ERROR?
040444  001021                                BNE     TS401-10        ;BR TO ERROR HALT ON SEQ ERROR
040446  005767  177264                        TST     PROFTE
040452  001022                                BNE     NODL2
040454  016700  137102                        MOV     TKB,R0          ;MAKE SURE RECEIVER DONE IS SET
040460  012767  000100  137072                MOV     #100,TRCSR      ;SET INTERRUPT ENABLE
040466  000005                                RESET                   ;SHOULD CLEAR INTERRUPT ENABLE
040470  032767  000100  137062                BIT     #100,TRCSR      ;TEST FOR CLEAR
040476  001410                                BEQ     TS401
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                      ;           CONDITIONAL BRANCH INST. AND    <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                      ;           WHICH FOLLOWS W/ 762            <====
040500  012742  001134                        MOV     #1134,-(R2)     ;MOVE TO MAILBOX #  *******  1134  *******
040504  005242                                INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040506  000000                                HALT                    ;RESET FAILED TO CLEAR TRCSR
                                                                      ;  OR SEQUENCE ERROR
040510  012742  001135                        MOV     #1135,-(R2)     ;MOVE TO MAILBOX #  *******  1135  *******
040514  005242                                INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040516  000000                                HALT                    ; WRONG $TSTNM
040520                                NODL2:
                                      ;*******************************************************************************
                                      ;TEST 401       TEST THAT RESET HAS NO EFFECT ON THE TRACE TRAP
                                      ;*******************************************************************************
040520  005212                        TS401:  INC     (R2)            ;UPDATE TEST NUMBER
040522  022712  000401                        CMP     #401,(R2)       ;SEQUENCE ERROR?
040526  001014                                BNE     RESET3          ;BR TO ERROR HALT ON SEQ ERROR
040530  012706  001000                        MOV     #BUFF,%6        ;SET STACK
040534  012767  040570  137252                MOV     #RESET2,14      ;SET UP TRACE VECTOR
040542  012746  000020                        MOV     #20,-(R6)       ;SET THE T-BIT ON STACK
040546  012746  040554                        MOV     #1$,-(R6)       ;MOVE NEW PC ON STACK
040552  000006                                RTT
040554  000005                        1$:     RESET                   ;SHOULD HAVE NO EFFECT
040556  000005                                RESET                   ;NO EFFECT
040560                                RESET3:
040560  012742  001136                        MOV     #1136,-(R2)     ;MOVE TO MAILBOX #  *******  1136  *******
040564  005242                                INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
040566  000000                                HALT                    ;TRACE TRAP FAILED,OR WRONG $TSTNM
040570  005067  137202                RESET2: CLR     STATUS          ;CLEAR TRACK
040574  005067  137216                        CLR     16              ;TRACE STATUS
040600  012767  000016  137206                MOV     #16,14
040606                                SKTST2:
                                      ;*******************************************************************************
                                      ;TEST 402       TEST THAT WHEN TTY INTERRUPTS IT POPS NEW STATUS
                                      ;*******************************************************************************
040606  005212                        TS402:  INC     (R2)            ;UPDATE TEST NUMBER
040610  022712  000402                        CMP     #402,(R2)       ;SEQUENCE ERROR?
040614  001057                                BNE     TTY11           ;BR TO ERROR HALT ON SEQ ERROR
040616  005767  177114                        TST     PROFTE
040622  001062                                BNE     NODL3
040624  122767  000001  137466                CMPB    #APTENV,$ENV            ;RUNING IN APT MODE?
040632  001003                                BNE     2$                      ;IF NOT, DO THIS TEST
040634  005767  137446                        TST     $PASS                   ;IS THIS THE FIRST PASS?
040640  001053                                BNE     NODL3                   ;IF NOT FIRST PASS, SKIP TEST
```

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040642                                  2$:
040642  000005                                  RESET
040644  012706  001000                          MOV     #BUFF,%6                ;SET UP STACK
040650  012767  040674  137206                  MOV     #TTY3,64                ;INTERRUPT VECTOR
040656  005067  137114                          CLR     STATUS                  ;DROP PROCESSOR PRIORITY
040662  012767  000357  137176                  MOV     #357,66                 ;HIGH PRIORITY ON INTERRUPT
040670  105167  136670                          COMB    TTCSR                   ;SHOULD SET INTERRUPT ENABLE & INTERRUPT
040674  026727  137076  000357  TTY3:           CMP     STATUS,#357
040702  001404                                  BEQ     1$
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 744             <====
040704  012742  001137                          MOV     #1137,-(R2)             ;MOVE TO MAILBOX #  *******  1137  *******
040710  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
040712  000000                                  HALT                            ;INTERRUPT DID NOT POP CORRECT STATUS
040714  000005                          1$:     RESET                           ;CLR NTERRUPT ENABLE
040716  012706  001000                          MOV     #BUFF,%6                ;STACK SET UP
040722  012767  040746  137134                  MOV     #TTY4,64                ;INTERRUPT VECTOR
040730  005067  137132                          CLR     66                      ;CLR NEW STATUS
040734  012767  000157  137034                  MOV     #157,STATUS             ;PROCESSOR STATUS
040742  105167  136616                          COMB    TTCSR                   ;SET INTERRUPT ENABLE
040746  005767  137024                  TTY4:   TST     STATUS
040752  001404                                  BEQ     TTT37
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                                ;           CONDITIONAL BRANCH INST. AND     <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION     <====
                                                                                ;           WHICH FOLLOWS W/ 720             <====
040754                                  TTY11:
040754  012742  001140                          MOV     #1140,-(R2)             ;MOVE TO MAILBOX #  *******  1140  *******
040760  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
040762  000000                                  HALT                            ;INCORRECT STATUS,OR WRONG $TSTNM
040764  105167  136574                  TTT37:  COMB    TTCSR
040770                                  NODL3:

                                        ;*******************************************************************************
                                        ;TEST 403               TEST THE 'WAIT' INSTRUCTION
                                        ;*******************************************************************************
040770  005212                          TS403:  INC     (R2)                    ;UPDATE TEST NUMBER
040772  022712  000403                          CMP     #403,(R2)               ;SEQUENCE ERROR?
040776  001062                                  BNE     STP4                    ;BR TO ERROR HALT ON SEQ ERROR
041000  122767  000001  137312                  CMPB    #APTENV,$ENV                    ;RUNING IN APT MODE?
041006  001003                                  BNE     1$                              ;IF NOT, DO THIS TEST
041010  005767  137272                          TST     $PASS                           ;IS THIS THE FIRST PASS?
041014  001057                                  BNE     STP4E                           ;IF NOT FIRST PASS, SKIP TEST
041016                                  1$:
041016  042767  000100  136540                  BIC     #100,TPS                ;CLEAR INTERRUPT ENABLE
041024  012706  001000                          MOV     #BUFF,SP                ;SET UP THE STACK
041030  012767  041116  137026                  MOV     #WATE,64                ;SET UP THE INTERRUPT VECTOR
041036  005067  137024                          CLR     66
041042  105767  136516                  WATE1:  TSTB    TPS                     ;WAIT FOR READY
041046  100375                                  BPL     WATE1                   ;TO BE UP
041050  012767  000015  136510                  MOV     #15,TPB                 ;DO A CARRIAGE RETURN
041056  105767  136502                  WATE2:  TSTB    TPS                     ;WAIT FOR READY TO COME UP
041062  100375                                  BPL     WATE2
041064  012767  000015  136474                  MOV     #15,TPB                 ;DO ANOTHER CARRIAGE RETURN
```

```
041072  052767  000100  136464          BIS     #100,TPS                ;SET THE INTERRUPT ENABLE
041100  005067  136672                  CLR     STATUS                  ;CLEAR THE PSW
041104  000001                  WATE3:  WAIT                            ;WAIT FOR THE INTERRUPT
041106  012742  001141                  MOV     #1141,-(R2)             ;MOVE TO MAILBOX #  *******  1141  *******
041112  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041114  000000                          HALT                            ;WAIT INSTRUCTION DID NOT LOOP
041116  005767  136654          WATE:   TST     STATUS  ;IS THE PSW CORRECT?
041122  001404                          BEQ     1$
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 725            <====
041124  012742  001142                  MOV     #1142,-(R2)             ;MOVE TO MAILBOX #  *******  1142  *******
041130  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041132  000000                          HALT                            ;NEW PSW SHOULD HAVE BEEN ZERO
041134  026727  137634  041106  1$:     CMP     BUFF-4,#WATE3+2         ;IS THE OLD PC SAVED
041142  001404                          BEQ     STP4E
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 715            <====
041144                          STP4:
041144  012742  001143                  MOV     #1143,-(R2)             ;MOVE TO MAILBOX #  *******  1143  *******
041150  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041152  000000                          HALT                            ;OLD PC WAS NOT SAVED OR WRONG $TESTN
041154                          STP4E:
                                ;*****************************************************************************************
                                ;TEST 404        TEST THAT USING REGISTER ADDR (177700) CAUSES TIME OUT.
                                ;*****************************************************************************************
041154  005212                  TS404:  INC     (R2)                    ;UPDATE TEST NUMBER
041156  022712  000404                  CMP     #404,(R2)               ;SEQUENCE ERROR?
041162  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.
                                        ;
041164  012706  001000                  MOV      #BUFF,SP               ;SET  STACK POINTER
041170  012737  041212  000004          MOV      #RETR1,@#RTRAP5        ;SET TRAP RETURN ADDR
041176  005737  177700          PCN1:   TST      @#177700               ;BAD ADDR REFERENCE, TRAP TO 4
041202  012742  001144                  MOV     #1144,-(R2)             ;MOVE TO MAILBOX #  *******  1144  *******
041206  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041210  000000                          HALT                            ;REFERENCING 177700 DID NOT CAUSE TIME OUT
041212  022767  041202  137554  RETR1:  CMP     #PCN1+4,BUFF-4          ;PROPER PC STORED ON STACK?
041220  001404                          BEQ     TS405
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 760            <====
041222  012742  001145                  MOV     #1145,-(R2)             ;MOVE TO MAILBOX #  *******  1145  *******
041226  005242                          INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041230  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.
                                        ;*************************************************************************
041232  005212                          TS405:  INC     (R2)                    ;UPDATE TEST NUMBER
041234  022712  000405                          CMP     #405,(R2)               ;SEQUENCE ERROR?
041240  001013                                  BNE     TS406-10                ;BR TO ERROR HALT ON SEQ ERROR
                                        ;
041242  012737  041270  000004                  MOV     #RETR2,@#RTRAP5         ;SET TRAP RETURN ADDR
041250  005037  000000                          CLR     @#0                     ;PUT ALL 0 IN LOC 0
041254  005337  000001                          DEC     @#1                     ;DECREMENT ODD ADDRESS, SHOULD NOT TRAP
041260  022737  177777  000000                  CMP     #-1,@#0                 ;WORD LOC 0 HAS ALL ONES?
041266  001404                                  BEQ     TS406
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                                ;           WHICH FOLLOWS W/ 764           <====
041270                                  RETR2:
041270  012742  001146                          MOV     #1146,-(R2)             ;MOVE TO MAILBOX #  *******  1146  *******
041274  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041276  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.
                                        ;*************************************************************************
041300  005212                          TS406:  INC     (R2)                    ;UPDATE TEST NUMBER
041302  022712  000406                          CMP     #406,(R2)               ;SEQUENCE ERROR?
041306  001016                                  BNE     TS407-10                ;BR TO ERROR HALT ON SEQ ERROR
041310  012737  041336  000004                  MOV     #RETR3,@#RTRAP5         ;SET TRAP RETURN ADDR
041316  012700  177700                          MOV     #177700,R0              ;STORES BAD MEMORY REFERENCE
041322  012720  001234                          MOV     #1234,(R0)+             ;BAD ADDR REFERENCE, TRAP TO LOC 4
041326  012742  001147                          MOV     #1147,-(R2)             ;MOVE TO MAILBOX #  *******  1147  *******
041332  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041334  000000                                  HALT                            ;ADDRESSING 177700 DID NOT CAUSE TRAP
041336  022700  177702                  RETR3:  CMP     #177702,R0              ;WAS R0 INCREMENTED?
041342  001404                                  BEQ     TS407
                                                                                ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                                ;           CONDITIONAL BRANCH INST. AND   <====
                                                                                ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                                ;           WHICH FOLLOWS W/ 761           <====
041344  012742  001150                          MOV     #1150,-(R2)             ;MOVE TO MAILBOX #  *******  1150  *******
041350  005242                                  INC     -(R2)                   ;SET MSGTYP TO FATAL ERROR
041352  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.
                                          ;*************************************************************************
041354  005212                           TS407:  INC     (R2)              ;UPDATE TEST NUMBER
041356  022712  000407                           CMP     #407,(R2)         ;SEQUENCE ERROR?
041362  001062                                   BNE     TS410-10          ;BR TO ERROR HALT ON SEQ ERROR
041364  012737  041442  000004                   MOV     #DBE1,@#RTRAP5    ;SET TRAP RETURN ADDR
041372  012737  000340  000006                   MOV     #340,@#6          ;SET UP PS
041400  012737  041432  000010                   MOV     #DBE2,@#RTRAP     ;SET TRAP RETURN ADDR
041406  012737  000340  000012                   MOV     #340,@#12         ;SET UP PS
041414  012706  177700                           MOV     #177700,SP        ;SET ILLEGAL SP
041420  000077                           DBE:    TRAPA                     ;ILLEGAL INSTRUCTION
041422  012742  001151                           MOV     #1151,-(R2)       ;MOVE TO MAILBOX #  *******  1151  *******
041426  005242                                   INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041430  000000                                   HALT                      ;DOUBLE BUS ERROR DID NOT CAUSE TRAP
041432                                   DBE2:
041432  012742  001152                           MOV     #1152,-(R2)       ;MOVE TO MAILBOX #  *******  1152  *******
041436  005242                                   INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041440  000000                                   HALT                      ;TRAP TO WRONG LOCATION
041442  022737  041422  000000           DBE1:   CMP     #DBE+2,@#0        ;OLD PC GOT SAVED?
041450  001404                                   BEQ     DBE3
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                           ;           CONDITIONAL BRANCH INST. AND   <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                           ;           WHICH FOLLOWS W/ 744           <====
041452  012742  001153                           MOV     #1153,-(R2)       ;MOVE TO MAILBOX #  *******  1153  *******
041456  005242                                   INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041460  000000                                   HALT                      ;OLD PC DID NOT GET SAVEDD
041462  022737  000340  000002           DBE3:   CMP     #340,@#2          ;CORRECT PS SAVED?
041470  001404                                   BEQ     DBE4
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                           ;           CONDITIONAL BRANCH INST. AND   <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                           ;           WHICH FOLLOWS W/ 734           <====
041472  012742  001154                           MOV     #1154,-(R2)       ;MOVE TO MAILBOX #  *******  1154  *******
041476  005242                                   INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041500  000000                                   HALT                      ;CORRECT PS DID NOT GET SAVE
041502  022706  000000                   DBE4:   CMP     #0,SP             ;SP POINTS TO LOC 0?
041506  001404                                   BEQ     DBE5
                                                                           ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS   <====
                                                                           ;           CONDITIONAL BRANCH INST. AND   <====
                                                                           ;           REPLACE THE MOVE INSTRUCTION   <====
                                                                           ;           WHICH FOLLOWS W/ 725           <====
041510  012742  001155                           MOV     #1155,-(R2)       ;MOVE TO MAILBOX #  *******  1155  *******
041514  005242                                   INC     -(R2)             ;SET MSGTYP TO FATAL ERROR
041516  000000                                   HALT                      ;SP IS NOT POINTING TO LOC 0
041520  012737  027324  000004           DBE5:   MOV     #TO4,@#RTRAP5     ;RESET TIMEOUT VECTOR
041526  012737  027334  000010                   MOV     #TO10,@#RTRAP     ;RESET ILLEGAL INST. VECTOR
041534  012706  001000                           MOV     #STBOT,SP         ;RESET SP


                                          ;*************************************************************************
                                          ;TEST 410        TEST MFPT
                                          ;*************************************************************************
```

```
041540  005212                          TS410:  INC     (R2)            ;UPDATE TEST NUMBER
041542  022712  000410                          CMP     #410,(R2)       ;SEQUENCE ERROR?
041546  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
041550  012706  001000                          MOV     #STBOT,R6       ;INIT. SP
041554  013746  000010                          MOV     @#10,-(SP)      ;SAVE TRAP VECTOR
041560  012737  041610  000010                  MOV     #1$,@#10        ;SET UP ILLEGAL INSTRUCTION TRAP
041566  010046                                  MOV     R0,-(SP)        ;SAVE R0
041570  000007                                  MFPT                    ;GET PROCESSOR MODEL
041572  010037  041620                          MOV     R0,@#CPUTYP     ;STORE IT
041576  012600                                  MOV     (SP)+,R0        ;RESTORE R0
041600  022737  000003  041620                  CMP     #3,@#CPUTYP     ;CHECK MODEL TYPE
041606  001405                                  BEQ     XXT
                                                                        ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS    <====
                                                                        ;           CONDITIONAL BRANCH INST. AND    <====
                                                                        ;           REPLACE THE MOVE INSTRUCTION    <====
                                                                        ;           WHICH FOLLOWS W/ 757            <====
041610                                  1$:
041610  012742  001156                          MOV     #1156,-(R2)     ;MOVE TO MAILBOX #  *******  1156  *******
041614  005242                                  INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
041616  000000                                  HALT                    ;ILLEGAL INSTR TRAP OR WRONG MODEL TYPE

041620  000000                          CPUTYP: .WORD   0
041622                                  XXT:
041622  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
                                        ;******************************************************************************
041626  005212                          TS411:  INC     (R2)            ;UPDATE TEST NUMBER
041630  022712  000411                          CMP     #411,(R2)       ;SEQUENCE ERROR?
041634  001022                                  BNE     TS412-10        ;BR TO ERROR HALT ON SEQ ERROR

041636  012706  001000                          MOV     #STBOT,R6       ;INIT STACK POINTER
041642  012737  041662  000010                  MOV     #1$,@#10                ;SET UP RETURN ADDR FROM TRAP
041650  012737  000340  000012                  MOV     #340,@#12       ;SET TRAP PRIORITY=7
041656  075006                                  FADD    R6              ;EXECUTE FIS INSTR..SHOULD CAUSE CTLERR
041660  000000                                  HALT                    ;DID NOT TRAP..CHECK CSEL LINE
041662  012737  041674  000010  1$:             MOV     #2$,@#10                ;SET UP RETURN ADDR FROM TRAP
041670  076000                                  76000                   ;EXECUTE CIS INSTR..SHOULD TRAP
041672  000000                                  HALT                    ;DID NOT TRAP
041674  012737  041706  000010  2$:             MOV     #3$,@#10                ;SET UP RETURN ADDR FROM TRAP
041702  076700                                  76700                   ;EXECUTE WCS INSTR..SHOULD CAUSE CTLERR AND TRAP
041704  000000                                  HALT                    ;DID NOT TRAP
041706  012706  001000          3$:             MOV     #STBOT,R6       ;RE-INIT STACK POINTER

                                        ;******************************************************************************
                                        ;TEST 412       TEST THAT ALL RESERVED INSTRUCTIONS TRAP
```

```
                                   ;*****************************************************************************************
041712  005212                     TS412:  INC     (R2)               ;UPDATE TEST NUMBER
041714  022712  000412                     CMP     #412,(R2)          ;SEQUENCE ERROR?
041720  001116                             BNE     RET4               ;BR TO ERROR HALT ON SEQ ERROR
041722  042767  000100  135634             BIC     #100,TPS
041730  012737  041756  000244             MOV     #TRAP244,@#244     ; SET UP TO SEE IF
041736  013767  000010  000024             MOV     @#10,TENSAVE       ;  THIS PROCESSOR HAS THE
041744  012737  041766  000010             MOV     #TRAP10,@#10       ;  FLOATING POINT OPTION
041752  170007                             .WORD   170007             ; AN ILLEGAL FPP INSTRUCTION
041754  000406                             BR      AROUND             ; THE FOLLOWING
041756                             TRAP244:                           ; IF FPP IN--
041756  013767  042310  000334             MOV     @#FPP,FINISH       ;  RESET END OF TABLE POINTER
041764  000002                             RTI                        ; AND RETURN
041766                             TRAP10:                            ; LEAVE THE TABLE ALONE
041766  000002                             RTI                        ; AND RETURN
041770  000000                     TENSAVE:.WORD   0                  ; A PLACE TO STORE CONTENTS OF 10

041772                             AROUND:                            ;  CONTINUATION POINT
041772  012737  000246  000244             MOV     #246,@#244         ;  RESTORE THE TRAP VECTOR
042000  016737  177764  000010             MOV     TENSAVE,@#10       ; RESTORE THE ILLEGAL INST. VECTOR
042006  012703  042200                     MOV     #TABLE,TAB         ;TABLE POINTER
042012  012305                     GIN1:   MOV     (TAB)+,FIRST       ;FIRST OR CURRENT INSTRUCTION
042014  012301                             MOV     (TAB)+,LAST        ;LAST INSTRUCTION OR GROUP
042016  020537  042254                     CMP     FIRST,@#CIS        ;HAVE WE TESTED UP TO THE CIS INSTRUCTION SPACE
042022  001007                             BNE     1$                 ;IF NO CONTINUE TESTING
042024  032777  000002  165422             BIT     #2,@SWR            ;IF YES,CHECK IF CIS CHIPS PRESENT
042032  001403                             BEQ     1$                 ;IF THEY ARE NOT CONTINUE TESTING
042034  012703  042310                     MOV     #FPP,TAB           ;IF CIS HERE SKIP CIS INSTRUCTION SPACE
042040  000764                             BR      GIN1
042042  020567  000252             1$:     CMP     FIRST,FINISH       ;TESTED ALL
042046  001415                             BEQ     GIN3               ;YES BRANCH
042050  010567  000246                     MOV     FIRST,INST         ;SET UP INST
042054  005267  000242             GIN2:   INC     INST
042060  012767  042112  135722             MOV     #RET,10            ;SET UP RETURN FROM TRAP
042066  012706  001000                     MOV     #BUFF,SP           ;SET UP STACK POINTER
042072  005067  135700                     CLR     CC                 ;CLEAR PRIORITY
042076  000167  000220                     JMP     INST               ;EXECUTE RESERVED INSTRUCTION
042102  012700  000370             GIN3:   MOV     #370,R0            ;RESET RESERVED AREA 370-402
042106  000167  000320                     JMP     THRPRT             ;JUMP TO EIS TEST


                                   ;TRAPPING SHOULD SEND YOU HERE
042112  020627  000774             RET:    CMP     SP,#BUFF-4         ;TEST DECREMENT OF SP
042116  001404                             BEQ     RET1
042120  012742  001157                     MOV     #1157,-(R2)        ;MOVE TO MAILBOX #  *******  1157  *******
042124  005242                             INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
042126  000000                             HALT                       ;WRONG DECREMENT
042130  026727  136640  042324     RET1:   CMP     BUFF-4,#INST+2     ;LOC OF INST UNINCREMENTED
042136  001404                             BEQ     RET2
042140  012742  001160                     MOV     #1160,-(R2)        ;MOVE TO MAILBOX #  *******  1160  *******
042144  005242                             INC     -(R2)              ;SET MSGTYP TO FATAL ERROR
042146  000000                             HALT                       ;INST INC ON TRAP
042150  005767  136622             RET2:   TST     BUFF-2
042154  001404                             BEQ     RET3
                                                                      ; TO SCOPE: CLEAR THE RIGHT BYTE OF THIS     <====
                                                                      ;           CONDITIONAL BRANCH INST. AND     <====
                                                                      ;           REPLACE THE MOVE INSTRUCTION     <====
```

```
                                                                ;               WHICH FOLLOWS W/ 661          <====
042156                          RET4:
042156  012742  001161                  MOV     #1161,-(R2)     ;MOVE TO MAILBOX #  *******  1161  *******
042162  005242                          INC     -(R2)           ;SET MSGTYP TO FATAL ERROR
042164  000000                          HALT                    ;CONDITION CODES SET ON TRAP OR WRONG $TSTNM
042166  026701  000130          RET3:   CMP     INST,LAST
042172  001707                          BEQ     GIN1            ;SET UP NEW GROUP
042174  000167  177654                  JMP     GIN2            ;FINISH OLD GROUP
                                                                ;END OF INSTRUCTION GROUP
042200  000007                  TABLE:  7                       ;END OF OPERATE
042202  000077                          77
042204  000207                          207                     ;RTS,RT1,JMP
042206  000227                          227
042210  006777                          6777
042212  007777                          7777
042214  075037                          075037
042216  076017                          76017
042220  076032                          76032
042222  076037                          76037
042224  076045                          76045
042226  076047                          76047
042230  076077                          76077
042232  076127                          76127
042234  076132                          76132
042236  076137                          76137
042240  076145                          76145
042242  076147                          76147
042244  076157                          76157
042246  076167                          76167
042250  076177                          76177
042252  076777                          76777
042254  076017                  CIS:    76017
042256  076032                          76032
042260  076037                          76037
042262  076045                          76045
042264  076047                          76047
042266  076077                          76077
042270  076127                          76127
042272  076132                          76132
042274  076137                          76137
042276  076145                          76145
042300  076147                          76147
042302  076157                          76157
042304  076167                          76167
042306  076177                          76177
042310  167777                  FPP:    167777                  ;  START OF THE FPP INSTRUCTIONS
042312  177700                          177700
042314  177716                          177716
042316  177777                          177777
042320  042320                  FINISH: .                       ;END FLAG
042322  000000                  INST:   HALT                    ;WILL CONTINUE RESERVED INST
042324  000000                          HALT                    ;SHOULD TRAP TO LOC 10
042326  000000                          HALT                    ;LOC 10 SHOULD SEND YOU TO
042330  000000                          HALT                    ;RET
042332  000000                          HALT
```

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


                                   PART THREE:             EIS INSTRUCTION TESTS


                                   ABSTRACT

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



                                   SWITCH SETTINGS

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


                                   BIT #   OCTAL VALUE              FUNCTION

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

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

                           .ENDR
```

```


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

042334                                  COUNT:
        042336                                  .=COUNT+2
042336                                  PSWORD:
        042340                                  .=PSWORD+2
042340                                  TEMP1:
        042342                                  .=TEMP1+2
042342                                  TEMP2:
        042344                                  .=TEMP2+2
042344                                  TEMP3:
        042346                                  .=TEMP3+2
042346                                  TEMP4:
        042350                                  .=TEMP4+2
042350  000000                          TEMP5:  .WORD
042352  000000                          TEMP6:  .WORD
042354     000                          TYPCNT: .BYTE
042355     000                          $TPCNT: .BYTE
042356  000007                          S0:     7
042360  177771                          S1:     -7
042362  042360                          S2:     S1
042364  177772                          S3:     -6
042366  177777                          S4:     -1
042370  040000                          S5:     40000
042372  042370                          S6:     S5
042374  040000                          S7:     40000
042376  177776                          S8:     -2
042400  000002                          S9:     2
042402  042400                          S10:    S9
042404  000002                          S11:    2
042406  000064                          TTYOUT: 64
042410  177566                          $TPB:   177566
042412  177564                          $TPS:   177564
042414  005015  020040  000040          $CRLF:  .ASCIZ  <15><12>/    /
042422  006412  047520  042527          POWER:  .ASCIZ  <12><15>/POWER/
042430  000122











042432  012705  000304                  THRPRT: MOV     #$TESTN,R5          ;MAKE R5 POINT TO THE LOCATION $TESTN
```

```
042436 005037 042334            CLR     @#COUNT         ;CLEAR THE COUNTER
042442 012715 000001            MOV     #1,(R5)         ;INITIALIZE TEST NUMBER
042446 012706 001000            MOV     #STBOT,SP       ;** STACK AT STBOT **
042452 012737 000001 042340     MOV     #1,@#TEMP1      ;TEMP1=1
042460 005037 042342            CLR     @#TEMP2         ;TEMP2=0
042464 012737 000001 042344     MOV     #1,@#TEMP3      ;TEMP3=1
042472 005037 042346            CLR     @#TEMP4         ;TEMP4=0
042476 012737 062320 000034     MOV     #$TRAP, @#34    ;SET UP TRAP INSTRUCTION VECTOR
042504 012737 000340 000036     MOV     #340, @#36      ;AND VECTOR PLUS TWO
042512 106427 000000            MTPS    #0              ;CLEAR PROCESSOR PRIORITY BITS IN PSW
```

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




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


042516  010767  135450          ASTART: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
042522  013700  042340                  MOV     @#TEMP1,%0          ;LOAD R0 WITH THE CONTENTS OF TEMP1
042526  032737  000001  000306          BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
042534  001004                          BNE     2$                  ;IF NOT THEN GO TO 2$
042536  013701  042342                  MOV     @#TEMP2,R1          ;OTHERWISE EXECUTE THE INSTRUCTION
                                                                    ;IN MODE 0 USING R1
042542  072001                          ASH     R1,R0
042544  000402                          BR      4$
042546  072067  177570          2$:     ASH     TEMP2,%0            ;SHIFT R0 BY THE NUMBER SPECIFIED BY TEMP2
042552  106737  042336          4$:     MFPS    @#PSWORD            ;SAVE PS
042556  123737  042346  042336          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
042564  001403                          BEQ     .+10
042566  004767  016020                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;THE PS IS NOT EQUAL TO 0
042572  000001                          1               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

042574  005237  042334                  INC     @#COUNT             ;INCREMENT THE COUNTER
042600  023700  042344                  CMP     @#TEMP3,%0          ;IS THE RESULT IN R0 EQUAL TO TEMP3?
042604  001403                          BEQ     .+10
042606                          6$:
042606  004767  016000                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                    ;EITHER INCORRECT R0 OR INCORRECT SEQUENCE
042612  000002                          2               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

042614  021537  042334                  CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE
                                                                    ;COUNTER?
042620  001372                          BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
042622  005215                          INC     (R5)
042624  010767  135342                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
042630  021527  000037                  CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                    ;BY 14. AND RIGHT BY 14.?
042634  002011                          BGE     8$
```

```
042636  005237  042342                          INC     @#TEMP2
042642  006367  177476                          ASL     TEMP3           ;SHIFT TEMP3 LEFT.
042646  021527  000020                          CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
042652  001004                                  BNE     REGR1
042654  000167  001010                          JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
042660  004767  001032                  8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
042664  010767  135302                  REGR1:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
042670  013701  042340                          MOV     @#TEMP1,%1      ;LOAD R1 WITH THE CONTENTS OF TEMP1
042674  032737  000001  000306                  BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
042702  001004                                  BNE     2$              ;IF NOT THEN GO TO 2$
042704  013702  042342                          MOV     @#TEMP2,R2      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
042710  072102                                  ASH     R2,R1           ;USING R1
042712  000402                                  BR      4$
042714  072167  177422                  2$:     ASH     TEMP2,%1        ;SHIFT R1 BY THE NUMBER SPECIFIED BY TEMP2
042720  106737  042336                  4$:     MFPS    @#PSWORD        ;SAVE PS
042724  123737  042346  042336                  CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
042732  001403                                  BEQ     .+10
042734  004767  015652                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
042740  000003                                  3               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

042742  005237  042334                          INC     @#COUNT         ;INCREMENT THE COUNTER
042746  023701  042344                          CMP     @#TEMP3,%1      ;IS THE RESULT IN R1 EQUAL TO TEMP3?
042752  001403                                  BEQ     .+10
042754                                  6$:
042754  004767  015632                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;EITHER INCORRECT R1 OR INCORRECT SEQUENCE
042760  000004                                  4               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

042762  021537  042334                          CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
042766  001372                                  BNE     6$              ;IF NOT GO TO THE HLT ABOVE
042770  005215                                  INC     (R5)
042772  010767  135174                          MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
042776  021527  000037                          CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                        ;BY 14. AND RIGHT BY 14.?
043002  002011                                  BGE     8$
043004  005237  042342                          INC     @#TEMP2
043010  006367  177330                          ASL     TEMP3           ;SHIFT TEMP3 LEFT
043014  021527  000020                          CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043020  001004                                  BNE     REGR2
043022  000167  000642                          JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043026  004767  000664                  8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043032  010767  135134                  REGR2:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
043036  013702  042340                          MOV     @#TEMP1,%2      ;LOAD R2 WITH THE CONTENTS OF TEMP1
043042  032737  000001  000306                  BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
043050  001004                                  BNE     2$              ;IF NOT THEN GO TO 2$
043052  013703  042342                          MOV     @#TEMP2,R3      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043056  072203                                  ASH     R3,R2           ;USING R2
043060  000402                                  BR      4$
043062  072267  177254                  2$:     ASH     TEMP2,%2        ;SHIFT R2 BY THE NUMBER SPECIFIED BY TEMP2
043066  106737  042336                  4$:     MFPS    @#PSWORD        ;SAVE PS
043072  123737  042346  042336                  CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
043100  001403                                  BEQ     .+10
043102  004767  015504                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
                                                                ;THE PS IS NOT EQUAL TO 0
043106  000005                          5               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043110  005237  042334                  INC     @#COUNT
043114  023702  042344                  CMP     @#TEMP3,%2          ;IS THE RESULT IN R2 EQUAL TO TEMP3?
043120  001403                          BEQ     .+10
043122                          6$:
043122  004767  015464                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;EITHER INCORRECT R2 OR INCORRECT SEQUENCE
043126  000006                          6               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043130  021537  042334                  CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043134  001372                          BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
043136  005215                          INC     (R5)
043140  010767  135026                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043144  021527  000037                  CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                    ;LEFT BY 14, AND RIGHT BY 14.?
043150  002011                          BGE     8$
043152  005237  042342                  INC     @#TEMP2
043156  006367  177162                  ASL     TEMP3               ;SHIFTED TEMP3 LEFT
043162  021527  000020                  CMP     (R5),#20            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043166  001004                          BNE     REGR3
043170  000167  000474                  JMP     NEGAT               ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043174  004767  000516          8$:     JSR     PC,TST37            ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043200  010767  134766          REGR3:  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043204  013703  042340                  MOV     @#TEMP1,%3          ;LOAD R3 WITH THE CONTENTS OF TEMP1
043210  032737  000001  000306          BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
043216  001004                          BNE     2$                  ;IF NOT THEN GO TO 2$
043220  013704  042342                  MOV     @#TEMP2,R4          ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043224  072304                          ASH     R4,R3               ;USING R3
043226  000402                          BR      4$
043230  072367  177106          2$:     ASH     TEMP2,%3            ;SHIFT R3 BY THE NUMBER SPECIFIED BY TEMP2
043234  106737  042336          4$:     MFPS    @#PSWORD            ;SAVE PS
043240  123737  042346  042336          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
043246  001403                          BEQ     .+10
043250  004767  015336                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0.
043254  000007                          7               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043256  005237  042334                  INC     @#COUNT
043262  023703  042344                  CMP     @#TEMP3,%3          ;IS THE RESULT IN R3 EQUAL TO TEMP3?
043266  001403                          BEQ     .+10
043270                          6$:
043270  004767  015316                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;EITHER INCORRECT R3 OR INCORRECT SEQUENCE
043274  000010                          10              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

043276  021537  042334                  CMP     (R5),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043302  001372                          BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
043304  005215                          INC     (R5)
043306  010767  134660                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043312  021527  000037                  CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
```

```
                                                                ;LEFT BY 14, AND RIGHT BY 14.?
043316  002010                          BGE     8$
043320  005237  042342                  INC     @#TEMP2
043324  006367  177014                  ASL     TEMP3                   ;SHIFT TEMP3 LEFT?
043330  021527  000020                  CMP     (R5),#20                ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043334  001003                          BNE     REGR4
043336  000554                          BR      NEGAT                   ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043340  004767  000352          8$:     JSR     PC,TST37                ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043344  010767  134622          REGR4:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
043350  013704  042340                  MOV     @#TEMP1,%4              ;LOAD R4 WITH THE CONTENTS OF TEMP1
043354  010501                          MOV     R5,R1                   ;SAVE R5
043356  032737  000001  000306          BIT     #1,@#$PASS              ;IS IT AN EVEN PASS ?
043364  001004                          BNE     2$                      ;IF NOT THEN GO TO 2$
043366  013705  042342                  MOV     @#TEMP2,R5              ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043372  072405                          ASH     R5,R4                   ;USING R4
043374  000402                          BR      4$
043376  072467  176740          2$:     ASH     TEMP2,%4                ;SHIFT R4 BY THE NUMBER SPECIFIED BY TEMP2
043402  106737  042336          4$:     MFPS    @#PSWORD                ;SAVE PS
043406  123737  042346  042336          CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
043414  001403                          BEQ     .+10
043416  004767  015170                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
043422  000011                          11                      ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

043424  005237  042334                  INC     @#COUNT
043430  023704  042344                  CMP     @#TEMP3,%4      ;IS THE RESULT IN R4 EQUAL TO TEMP3?
043434  001403                          BEQ     .+10
043436                          6$:
043436  004767  015150                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;EITHER INCORRECT R4 OR INCORRECT SEQUENCE
043442  000012                          12                      ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

043444  010105                          MOV     R1,R5                   ;RESTORE R5
043446  021537  042334                  CMP     (R5),@#COUNT            ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043452  001371                          BNE     6$                      ;IF NOT GO TO THE HLT ABOVE
043454  005215                          INC     (R5)
043456  010767  134510                  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
043462  021527  000037                  CMP     (R5),#37                ;HAS THE CONTENTS OF REGISTERS BEEN
                                                                        ;SHIFTED LEFT BY 14. AND RIGHT BY 14.?
043466  002010                          BGE     8$
043470  005237  042342                  INC     @#TEMP2
043474  006367  176644                  ASL     TEMP3                   ;SHIFT TEMP3 LEFT
043500  021527  000020                  CMP     (R5),#20                ;HAS THE CONTENTS OF REGISTER BEEN SHIFTED BY 14.?
043504  001003                          BNE     REGR5
043506  000470                          BR      NEGAT                   ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043510  004767  000202          8$:     JSR     PC,TST37                ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043514  010767  134452          REGR5:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
043520  010501                          MOV     R5,R1                   ;SAVE R5
043522  013705  042340                  MOV     @#TEMP1,%5              ;LOAD R5 WITH THE CONTENTS OF TEMP1
043526  032737  000001  000306          BIT     #1,@#$PASS              ;IS IT AN EVEN PASS ?
043534  001004                          BNE     2$                      ;IF NOT THEN GO TO 2$
043536  013700  042342                  MOV     @#TEMP2,R0              ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
043542  072500                          ASH     R0,R5                   ;USING R5
043544  000402                          BR      4$
```

```
043546 072567 176570          2$:     ASH     TEMP2,%5            ;SHIFT R5 BY THE NUMBER SPECIFIED BY TEMP2
043552 106737 042336          4$:     MFPS    @#PSWORD            ;SAVE PS
043556 123737 042346 042336           CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
043564 001403                         BEQ     .+10
043566 004767 015020                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                      ;THE PS IS NOT EQUAL TO 0.
043572 000013                         13              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

043574 005237 042334                  INC     @#COUNT
043600 023705 042344                  CMP     @#TEMP3,%5          ;IS THE RESULT IN R5 EQUAL TO TEMP3?
043604 001403                         BEQ     .+10
043606                        6$:
043606 004767 015000                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                      ;EITHER INCORRECT R5 OR INCORRECT SEQUENCE
043612 000014                         14              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                      ;BY  (013746  000172  000207)

043614 021137 042334                  CMP     (R1),@#COUNT        ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
043620 001372                         BNE     6$                  ;IF NOT GO TO THE HLT ABOVE
043622 010105                         MOV     R1,R5               ;RESTORE R5
043624 005215                         INC     (R5)
043626 010767 134340                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
043632 021527 000037                  CMP     (R5),#37            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                  ;LEFT BY 14. AND RIGHT BY 14.?

043636 002010                         BGE     8$                  ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
043640 005237 042342                  INC     @#TEMP2
043644 006367 176474                  ASL     TEMP3               ;SHIFT TEMP3 LEFT
043650 021527 000020                  CMP     (R5),#20            ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
043654 001405                         BEQ     NEGAT               ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
043656 000402                         BR      10$
043660 004767 000032          8$:     JSR     PC,TST37
043664 000167 176626          10$:    JMP     ASTART              ;GO BACK TO START
043670 012737 040000 042340   NEGAT:  MOV     #40000,@#TEMP1      ;TEMP1=40000
043676 012737 177762 042342           MOV     #177762,@#TEMP2     ;TEMP2=177762
043704 012737 000001 042344           MOV     #1,@#TEMP3          ;TEMP3=1
043712 000167 176600                  JMP     ASTART
043716 021527 000037          TST37:  CMP     (R5),#37            ;IS IT TEST 37?
043722 001013                         BNE     TST40               ;IF NOT THEN TRY TEST 40
043724 005037 042340                  CLR     @#TEMP1             ;0
043730 012737 000020 042342           MOV     #16.,@#TEMP2        ;SHIFTED BY 16
043736 005037 042344                  CLR     @#TEMP3             ;IS=0
043742 012737 000004 042346           MOV     #4,@#TEMP4          ;AND PS=4
043750 000207                         RTS     PC
043752 021527 000040          TST40:  CMP     (R5),#40            ;IS IT TEST 40?
043756 001003                         BNE     TST41               ;IF NOT THEN TRY TEST 41
043760 005037 042342                  CLR     @#TEMP2             ;0 SHIFTED BY 0=0 AND PS=4
043764 000207                         RTS     PC
043766 021527 000041          TST41:  CMP     (R5),#41            ;IS IT TEST 41?
043772 001004                         BNE     TST42               ;IF NOT THEN TRY TEST 42
043774 012737 177760 042342           MOV     #-16.,@#TEMP2       ;0 SHIFTED BY -16.=0 AND PS=4
044002 000207                         RTS     PC
044004 021527 000042          TST42:  CMP     (R5),#42            ;IS IT TEST 42?
044010 001013                         BNE     TST43               ;IF NOT THEN TRY TEST 43
044012 012737 100000 042340           MOV     #100000,@#TEMP1     ;100000
```

```
044020 005237 042342                  INC     @#TEMP2            ;SHIFTED BY -15
044024 005337 042344                  DEC     @#TEMP3            ;IS=-1
044030 012737 000010 042346           MOV     #10,@#TEMP4          ;AND PS=10
044036 000207                         RTS     PC
044040 021527 000043          TST43:  CMP     (R5),#43           ;IS IT TEST 43?
044044 001012                         BNE     TST44              ;IF NOT THEN IF NOT THEN TRY TEST 44
044046 012737 125252 042340           MOV     #125252,@#TEMP1    ;125252
044054 012737 177777 042342           MOV     #-1,@#TEMP2        ;SHIFTED BY -1
044062 012737 152525 042344           MOV     #152525,@#TEMP3    ;IS=152525 AND PS=10
044070 000207                         RTS     PC
044072 021527 000044          TST44:  CMP     (R5),#44           ;IS IT TEST 44?
044076 001012                         BNE     TST45              ;IF NOT THEN TRY TEST 45
044100 012737 000001 042342           MOV     #1,@#TEMP2         ;125252 SHIFTED BY 1
044106 012737 052524 042344           MOV     #52524,@#TEMP3     ;IS=52524
044114 012737 000003 042346           MOV     #3,@#TEMP4         ;AND PS=3
044122 000207                         RTS     PC
044124 021527 000045          TST45:  CMP     (R5),#45           ;IS IT TEST 45?
044130 001012                         BNE     TST46              ;IF NOT THEN TRY TEST 46
044132 012737 177776 042342           MOV     #-2,@#TEMP2        ;125252 SHIFTED BY -2
044140 012737 165252 042344           MOV     #165252,@#TEMP3    ;IS=165252
044146 012737 000011 042346           MOV     #11,@#TEMP4        ;AND PS=11
044154 000207                         RTS     PC
044156 021527 000046          TST46:  CMP     (R5),#46           ;IS IT TEST 46?
044162 001014                         BNE     TST47              ;IF NOT THEN TRY TEST 47
044164 012737 177777 042340           MOV     #-1,@#TEMP1        ;-1
044172 012737 000020 042342           MOV     #16.,@#TEMP2       ;SHIFTED BY 15.
044200 005037 042344                  CLR     @#TEMP3            ;IS=0
044204 012737 000007 042346           MOV     #7,@#TEMP4         ;AND PS=7
044212 000207                         RTS     PC
044214 021527 000047          TST47:  CMP     (R5),#47           ;IS IT TEST 47?
044220 001011                         BNE     TST50              ;IF NOT THEN TRY TEST 50
044222 005337 042342                  DEC     @#TEMP2            ;-1 SHIFTED BY 15
044226 012737 100000 042344           MOV     #100000,@#TEMP3    ;IS=100000
044234 012737 000011 042346           MOV     #11,@#TEMP4        ;AND PS=11
044242 000207                         RTS     PC
044244 021527 000050          TST50:  CMP     (R5),#50           ;IS IT TEST 50
044250 001007                         BNE     ENT51              ;IF NOT THEN TRY TEST 51
044252 012737 137777 042340           MOV     #137777,@#TEMP1    ;137777 SHIFTED BY 15. IS=100000
044260 012737 000013 042346           MOV     #13,@#TEMP4        ;AND PS=13
044266 000207                         RTS     PC
044270 021527 000051          ENT51:  CMP     (R5),#51           ;IS IT ENTERING TEST 51?
044274 001403                         BEQ     .+10
044276 004767 014310                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                 ;TEST NUMBER GOOFED
044302 000015                         15                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                         ;BY  (013746  000172  000207)



044304 005726                         TST     (SP)+              ;RESTORE STACK POINTER
044306 012704 177771                  MOV     #-7,%4
044312 012702 042360                  MOV     #S1,%2
044316 012703 042362                  MOV     #S2,%3
                              ;*****************************************************************
                              ;TEST:51        ASH     125252 SHIFTED BY #5 = 52500  PS = 3
                              ;*****************************************************************
```

```
044322  010767  133644          TST51:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044326  012701  125252                  MOV     #125252,%1              ;LOAD R1 WITH 125252
044332  072127  000005                  ASH     #5,%1                   ;SHIFT R1 BY #5
044336  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
044342  122737  000003  042336          CMPB    #3,@#PSWORD             ;IS THE PS 3?
044350  001403                          BEQ     .+10
044352  004767  014234                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 3
044356  000016                          16              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044360  022701  052500                  CMP     #52500,%1               ;IS THE RESULT 52500?
044364  001403                          BEQ     .+10
044366                          1$:
044366  004767  014220                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R1 IS NOT EQUAL TO 52500 OR INCORRECT SEQUENCE
044372  000017                          17              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044374  021527  000051                  CMP     (R5),#51                        ;IS $TESTN = #51
044400  001372                          BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044402  005215                          INC     (R5)



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

044404  010767  133562          TST52:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044410  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
044414  072077  175742                  ASH     @S2,%0                  ;SHIFT R0 BY @S2
044420  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
044424  122737  000010  042336          CMPB    #10,@#PSWORD            ;IS THE PS 10?
044432  001403                          BEQ     .+10
044434  004767  014152                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
044440  000020                          20              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044442  022700  177525                  CMP     #177525,%0              ;IS THE RESULT 177525?
044446  001403                          BEQ     .+10
044450                          1$:
044450  004767  014136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044454  000021                          21              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

044456  021527  000052                  CMP     (R5),#52                        ;IS $TESTN = #52
044462  001372                          BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044464  005215                          INC     (R5)



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

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

044466  010767  133500                  TST53:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044472  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
044476  072037  042360                          ASH     @#S1,%0                 ;SHIFT R0 BY @#S1
044502  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
044506  122737  000010  042336                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
044514  001403                                  BEQ     .+10
044516  004767  014070                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044522  000022                                  22              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044524  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
044530  001403                                  BEQ     .+10
044532                                  1$:
044532  004767  014054                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044536  000023                                  23              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044540  021527  000053                          CMP     (R5),#53                        ;IS $TESTN = #53
044544  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044546  005215                                  INC     (R5)



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

044550  010767  133416                  TST54:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044554  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
044560  072012                                  ASH     (2),%0                  ;SHIFT R0 BY (2)
044562  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
044566  122737  000010  042336                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
044574  001403                                  BEQ     .+10
044576  004767  014010                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044602  000024                                  24              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044604  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
044610  001403                                  BEQ     .+10
044612                                  1$:
044612  004767  013774                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044616  000025                                  25              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044620  021527  000054                          CMP     (R5),#54                        ;IS $TESTN = #54
044624  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044626  005215                                  INC     (R5)
```

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

044630  010767  133336                  TST55:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044634  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
044640  072022                                  ASH     (2)+,%0                 ;SHIFT R0 BY (2)+
044642  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
044646  122737  000010  042336                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
044654  001403                                  BEQ     .+10
044656  004767  013730                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044662  000026                                  26              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044664  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
044670  001403                                  BEQ     .+10
044672                                  1$:
044672  004767  013714                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044676  000027                                . 27              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044700  021527  000055                          CMP     (R5),#55                        ;IS $TESTN = #55
044704  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044706  005215                                  INC     (R5)




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

044710  010767  133256                  TST56:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044714  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
044720  072042                                  ASH     -(2),%0                 ;SHIFT R0 BY -(2)
044722  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
044726  122737  000010  042336                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
044734  001403                                  BEQ     .+10
044736  004767  013650                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
044742  000030                                  30              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044744  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
044750  001403                                  BEQ     .+10
044752                                  1$:
044752  004767  013634                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
044756  000031                                  31              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

044760  021527  000056                          CMP     (R5),#56                        ;IS $TESTN = #56
044764  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
044766  005215                                  INC     (R5)
```

```



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

044770  010767  133176                  TST57:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
044774  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
045000  072063  000002                          ASH     2(3),%0                 ;SHIFT R0 BY 2(3)
045004  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
045010  122737  000011  042336                  CMPB    #11,@#PSWORD            ;IS THE PS 11?
045016  001403                                  BEQ     .+10
045020  004767  013566                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
045024  000032                                  32              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

045026  022700  177252                          CMP     #177252,%0              ;IS THE RESULT 177252?
045032  001403                                  BEQ     .+10
045034                                  1$:
045034  004767  013552                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177252 OR INCORRECT SEQUENCE
045040  000033                                  33              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

045042  021527  000057                          CMP     (R5),#57                        ;IS $TESTN = #57
045046  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
045050  005215                                  INC     (R5)



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

045052  010767  133114                  TST60:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
045056  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
045062  072073  000000                          ASH     @(3),%0                 ;SHIFT R0 BY @(3)
045066  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
045072  122737  000010  042336                  CMPB    #10,@#PSWORD            ;IS THE PS 10?
045100  001403                                  BEQ     .+10
045102  004767  013504                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
045106  000034                                  34              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

045110  022700  177525                          CMP     #177525,%0              ;IS THE RESULT 177525?
045114  001403                                  BEQ     .+10
045116                                  1$:
045116  004767  013470                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045122  000035                                  35              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

045124  021527  000060                          CMP     (R5),#60                        ;IS $TESTN = #60
045130  001372                                  BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
```

```
045132  005215                          INC     (R5)



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

045134  010767  133032          TST61:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
045140  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
045144  072033                          ASH     @(3)+,%0                ;SHIFT R0 BY @(3)+
045146  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
045152  122737  000010  042336          CMPB    #10,@#PSWORD            ;IS THE PS 10?
045160  001403                          BEQ     .+10
045162  004767  013424                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
045166  000036                          36              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045170  022700  177525                  CMP     #177525,%0              ;IS THE RESULT 177525?
045174  001403                          BEQ     .+10
045176                          1$:
045176  004767  013410                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045202  000037                          37              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045204  021527  000061                  CMP     (R5),#61                        ;IS $TESTN = #61
045210  001372                          BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
045212  005215                          INC     (R5)



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

045214  010767  132752          TST62:  MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
045220  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
045224  072053                          ASH     @-(3),%0                ;SHIFT R0 BY @-(3)
045226  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
045232  122737  000010  042336          CMPB    #10,@#PSWORD            ;IS THE PS 10?
045240  001403                          BEQ     .+10
045242  004767  013344                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
045246  000040                          40              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045250  022700  177525                  CMP     #177525,%0              ;IS THE RESULT 177525?
045254  001403                          BEQ     .+10
045256                          1$:
045256  004767  013330                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
045262  000041                          41              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
12266 045264 021527 000062          CMP     (R5),#62            ;IS $TESTN = #62
12267 045270 001372                 BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
12268 045272 005215                 INC     (R5)
12269
12270
12271
```

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


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



045274  010767  132672                  MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
045300  012737  000062  042334          MOV     #62,@#COUNT
045306  005037  042340                  CLR     @#TEMP1             ;TEMP1=0
045312  012737  000001  042342          MOV     #1,@#TEMP2          ;TEMP2=1
045320  005037  042344                  CLR     @#TEMP3             ;TEMP3=0
045324  005037  042346                  CLR     @#TEMP4             ;TEMP4=0
045330  012737  000001  042350          MOV     #1,@#TEMP5          ;TEMP5=1
045336  005037  042352                  CLR     @#TEMP6             ;0 1 SHIFTED BY 0=0 1, PS=0

045342  010502                  REG01:  MOV     R5,R2               ;SAVE R5
045344  013700  042340                  MOV     @#TEMP1,%0          ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 0
045350  013701  042342                  MOV     @#TEMP2,%0!1        ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 1
045354  000241                          CLC
045356  032737  000001  000306          BIT     #1,@#$PASS          ;IS IT AN EVEN PASS ?
045364  001004                          BNE     2$                  ;IF NOT THEN GO TO 2$
045366  013705  042344                  MOV     @#TEMP3,R5          ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045372  073005                          ASHC    R5,R0               ;USING R0
045374  000402                          BR      4$
045376  073067  174742          2$:     ASHC    TEMP3,%0            ;ASHC REGISTER 0 BY THE CONTENTS OF TEMP3
045402  106737  042336          4$:     MFPS    @#PSWORD            ;SAVE PS
045406  123737  042352  042336          CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045414  001403                          BEQ     .+10
045416  004767  013170                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG PS
045422  000042                          42              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045424  005237  042334                  INC     @#COUNT
045430  023700  042346                  CMP     @#TEMP4,%0          ;IS THE RESULT IN R0 SAME AS TEMP4?
045434  001403                          BEQ     .+10
045436  004767  013150                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG RESULT IN R0
045442  000043                          43              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045444  023701  042350                  CMP     @#TEMP5,%1          ;IS THE RESULT IN R1 SAME AS TEMP5?
045450  001403                          BEQ     .+10                ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                                    ;AND PS=TEMP6
045452  004767  013134                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG RESULT IN R1
045456  000044                          44              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

045460  010205                          MOV     R2,R5               ;RESTORE R5
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```
045462  021537  042334                    CMP     (R5),@#COUNT      ;IS TEST NUMBER=COUNTER?
045466  001403                            BEQ     .+10
045470  004767  013116                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;NO
045474  000045                            45                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045476  005215                            INC     (R5)
045500  021527  000160                    CMP     (R5),#160         ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045504  002014                            BGE     6$                ;YES
045506  005237  042344                    INC     @#TEMP3
045512  000241                            CLC
045514  006137  042350                    ROL     @#TEMP5           ;ROTATE TEMP5 LEFT BY 1 PLACE
045520  006137  042346                    ROL     @#TEMP4           ;INTRODUCE CARRY FROM TEMP4 IN TEMP5
045524  021527  000121                    CMP     (R5),#121         ;IS IT TEST 121?
045530  001004                            BNE     REGR23
045532  004467  000414                    JSR     R4,RITSH          ;IF SO THEN GO AND INITIATE RIGHT SHIFT
045536  004767  000444           6$:      JSR     %7,TST160
045542  010767  132424           REGR23:  MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
045546  013702  042340                    MOV     @#TEMP1,%2        ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 2
045552  013703  042342                    MOV     @#TEMP2,%2!1      ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 3
045556  000241                            CLC
045560  032737  000001  000306            BIT     #1,@#$PASS        ;IS IT AN EVEN PASS ?
045566  001004                            BNE     2$                ;IF NOT THEN GO TO 2$
045570  013704  042344                    MOV     @#TEMP3,R4        ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045574  073204                            ASHC    R4,R2             ;USING R2
045576  000402                            BR      4$
045600  073267  174540           2$:      ASHC    TEMP3,%2          ;ASHC REGISTER 2 BY THE CONTETNS OF TEMP3
045604  106737  042336           4$:      MFPS    @#PSWORD          ;SAVE PS
045610  123737  042352  042336            CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
045616  001403                            BEQ     .+10
045620  004767  012766                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG PS
045624  000046                            46                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045626  005237  042334                    INC     @#COUNT
045632  023702  042346                    CMP     @#TEMP4,%2        ;IS THE RESULT IN R2 SAME AS TEMP4?
045636  001403                            BEQ     .+10
045640  004767  012746                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG RESULT IN R2
045644  000047                            47                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045646  023703  042350                    CMP     @#TEMP5,%3        ;IS THE RESULT IN R3 SAME AS TEMP5?
045652  001403                            BEQ     .+10              ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                            ;AND PS=TEMP6
045654  004767  012732                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG RESULT IN R1
045660  000050                            50                ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

045662  021537  042334                    CMP     (R5),@#COUNT      ;IS TEST NUMBER=COUNTER?
045666  001403                            BEQ     .+10
045670  004767  012716                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;NO
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045674  000051                                 51              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)
045676  005215                                 INC     (R5)
045700  021527  000160                         CMP     (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
045704  002014                                 BGE     6$              ;YES
045706  005237  042344                         INC     @#TEMP3
045712  000241                                 CLC
045714  006137  042350                         ROL     @#TEMP5         ;ROTATE TEMP5 LEFT BY 1 PLACE
045720  006137  042346                         ROL     @#TEMP4         ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
045724  021527  000121                         CMP     (R5),#121       ;IS IT TEST 121?
045730  001004                                 BNE     REG45
045732  004467  000214                         JSR     R4,RITSH        ;IF SO THEN GO AND INITIATE RIGHT SHIFT
045736  004767  000244                 6$:     JSR     %7,TST160
045742  010767  132224                 REG45:  MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
045746  010501                                 MOV     R5,R1           ;SAVE R5
045750  013704  042340                         MOV     @#TEMP1,%4      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 4
045754  013705  042342                         MOV     @#TEMP2,%4!1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 5
045760  000241                                 CLC
045762  032737  000001  000306                 BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
045770  001004                                 BNE     2$              ;IF NOT THEN GO TO 2$
045772  013700  042344                         MOV     @#TEMP3,R0      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
045776  073400                                 ASHC    R0,R4           ;USING R4
046000  000402                                 BR      4$
046002  073467  174336                 2$:     ASHC    TEMP3,%4        ;ASHC REGISTER 4 BY THE CONTENTS OF TEMP3
046006  106737  042336                 4$:     MFPS    @#PSWORD        ;SAVE PS
046012  123737  042352  042336                 CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
046020  001403                                 BEQ     .+10
046022  004767  012564                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;WRONG PS
046026  000052                                 52              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)
046030  005237  042334                         INC     @#COUNT
046034  023704  042346                         CMP     @#TEMP4,%4      ;IS THE RESULT IN R4 SAME AS TEMP4?
046040  001403                                 BEQ     .+10
046042  004767  012544                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;WRONG RESULT IN R4
046046  000053                                 53              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)
046050  023705  042350                         CMP     @#TEMP5,%5      ;IS THE RESULT IN R5 SAME AS TEMP5?
046054  001403                                 BEQ     .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                                       ;AND PS=TEMP6
046056  004767  012530                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;WRONG RESULT IN R5
046062  000054                                 54              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)
046064  021137  042334                         CMP     (R1),@#COUNT    ;IS TEST NUMBER=COUNTER?
046070  001403                                 BEQ     .+10
046072  004767  012514                         JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                       ;NO
046076  000055                                 55              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                               ;BY  (013746  000172  000207)
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```
046100 010105                          MOV   R1,R5              ;RESTORE R5
046102 005215                          INC   (R5)
046104 021527 000160                   CMP   (R5),#160          ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
046110 002014                          BGE   6$                 ;YES
046112 005237 042344                   INC   @#TEMP3
046116 000241                          CLC
046120 006137 042350                   ROL   @#TEMP5            ;ROTATE TEMP5 LEFT BY 1 PLACE
046124 006137 042346                   ROL   @#TEMP4            ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
046130 021527 000121                   CMP   (R5),#121          ;IS IT TEST 121?
046134 001004                          BNE   8$
046136 004467 000010                   JSR   R4,RITSH           ;IF SO THEN GO AND INITIATE RIGHT SHIFT
046142 004767 000040           6$:     JSR   %7,TST160
046146 000167 177170           8$:     JMP   REG01
046152 022424                  RITSH:  CMP   (R4)+,(R4)+        ;MAKE R4 POINT TO THE NEXT REG TAG
046154 012737 040000 042340            MOV   #40000,@#TEMP1     ;TEMP1=4000
046162 005037 042342                   CLR   @#TEMP2            ;TEMP2=0
046166 012737 177742 042344            MOV   #-30.,@#TEMP3      ;TEMP3=-30
046174 005037 042346                   CLR   @#TEMP4            ;TEMP4=0
046200 005237 042350                   INC   @#TEMP5            ;TEMP5=1
046204 000204                          RTS   R4
046206 021527 000160           TST160: CMP   (R5),#160          ;IS IT TEST 160
046212 001010                          BNE   TST161             ;IF NOT THEN TRY TEST 161
046214 005037 042340                   CLR   @#TEMP1            ;0 0 SHIFTED BY 0
046220 005037 042346                   CLR   @#TEMP4            ;IS EQUAL TO 0 0
046224 012737 000004 042352            MOV   #4,@#TEMP6         ;AND PS=4
046232 000207                          RTS   %7
046234 021527 000161           TST161: CMP   (R5),#161          ;IS IT TEST 161
046240 001004                          BNE   TST162
046242 012737 177746 042344            MOV   #-32,@#TEMP3       ;0 0 SHIFTED BY -32=0 0, PS=4
046250 000207                          RTS   %7
046252 021527 000162           TST162: CMP   (R5),#162          ;IS IT TEST 162
046256 001004                          BNE   TST163             ;IF NOT THEN TRY TEST 163
046260 012737 000032 042344            MOV   #32,@#TEMP3        ;0 0 SHIFTED BY 32=0 0, PS=4
046266 000207                          RTS   %7
046270 021527 000163           TST163: CMP   (R5),#163          ;IS IT TEST 163?
046274 001016                          BNE   TST164             ;IF NOT THEN TRY TEST 164
046276 012737 052525 042340            MOV   #52525,@#TEMP1     ;52525 0
046304 012737 177760 042344            MOV   #-16.,@#TEMP3      ;SHIFTED BY -16.
046312 005037 042346                   CLR   @#TEMP4
046316 012737 052525 042350            MOV   #52525,@#TEMP5     ;IS EQUAL TO 0 52525
046324 005037 042352                   CLR   @#TEMP6            ;AND PS = 0
046330 000207                          RTS   %7
046332 021527 000164           TST164: CMP   (R5),#164          ;IS IT TEST 164?
046336 001014                          BNE   TST165             ;IF NOT THEN TRY TEST 165
046340 012737 125252 042340            MOV   #125252,@#TEMP1    ;125252 0 SHIFTED BY -16.
046346 005337 042346                   DEC   @#TEMP4
046352 012737 125252 042350            MOV   #125252,@#TEMP5    ;IS EQUAL TO -1 125252
046360 012737 000010 042352            MOV   #10,@#TEMP6        ;AND PS=10
046366 000207                          RTS   %7
046370 021527 000165           TST165: CMP   (R5),#165          ;IS IT TEST 165?
046374 001007                          BNE   TST166             ;IF NOT THEN TRY TEST 166
046376 012737 177777 042340            MOV   #-1,@#TEMP1        ;-1 0 SHIFTED BY -16
046404 012737 177777 042350            MOV   #-1,@#TEMP5        ;IS EQUAL TO -1 -1, AND PS=10
046412 000207                          RTS   %7
046414 021527 000166           TST166: CMP   (R5),#166          ;IS IT TEST 166?
046420 001011                          BNE   TST167             ;IF NOT THEN TRY TEST 167
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046422  012737  100000  042340            MOV   #100000,@#TEMP1   ;100000 0
046430  012737  177740  042344            MOV   #-32.,@#TEMP3     ;SHIFTED BY -32 IS EQUAL TO -1 -1
046436  005237  042352                    INC   @#TEMP6           ;AND PS=11
046442  000207                            RTS   %7
046444  021527  000167           TST167:  CMP   (R5),#167         ;IS IT TEST 167?
046450  001014                            BNE   TST170            ;IF NOT THEN TRY TEST 170
046452  005037  042340                    CLR   @#TEMP1
046456  005337  042342                    DEC   @#TEMP2           ;0 -1
046462  012737  000020  042344            MOV   #16.,@#TEMP3      ;SHIFTED BY 16.
046470  005037  042350                    CLR   @#TEMP5           ;IS EQUAL TO -1 0
046474  005237  042352                    INC   @#TEMP6           ;AND PS=12
046500  000207                            RTS   %7
046502  021527  000170           TST170:  CMP   (R5),#170         ;IS IT TEST 170?
046506  001007                            BNE   TST171            ;IF NOT THEN TRY TEST 171
046510  012737  125252  042342            MOV   #125252,@#TEMP2   ;0 125252 SHIFTED BY 16
046516  012737  125252  042346            MOV   #125252,@#TEMP4   ;IS EQUAL TO 125252 0, AND PS=12
046524  000207                            RTS   %7
046526  021527  000171           TST171:  CMP   (R5),#171         ;IS IT TEST 171?
046532  001010                            BNE   TST172            ;IF NOT THEN TRY TEST 172
046534  005337  042344                    DEC   @#TEMP3           ;0 125252 SHIFTED BY 15
046540  012737  052525  042346            MOV   #52525,@#TEMP4    ;IS EQUAL TO 52525 0
046546  005037  042352                    CLR   @#TEMP6           ;AND PS=0
046552  000207                            RTS   %7
046554  021527  000172           TST172:  CMP   (R5),#172         ;IS IT TEST 172?
046560  001006                            BNE   TST173            ;IF NOT THEN TRY TEST 173
046562  012737  052525  042342            MOV   #52525,@#TEMP2    ;0 52525
046570  005237  042344                    INC   @#TEMP3           ;SHIFTED BY 16. IS EQUAL TO 52525 0, AND PS=0
046574  000207                            RTS   %7
046576  021527  000173           TST173:  CMP   (R5),#173         ;IS IT TEST 173?
046602  001014                            BNE   TST174            ;IF NOT THEN TRY TEST 174
046604  012737  177777  042342            MOV   #-1,@#TEMP2       ;0 -1
046612  005337  042344                    DEC   @#TEMP3           ;SHIFTED BY 15.
046616  012737  077777  042346            MOV   #77777,@#TEMP4
046624  012737  100000  042350            MOV   #100000,@#TEMP5   ;IS EQUAL TO 77777 100000, AND PS=0
046632  000207                            RTS   %7
046634  021527  000174           TST174:  CMP   (R5),#174         ;IS IT TEST 174?
046640  001013                            BNE   TST175            ;IF NOT THEN TRY TEST 175
046642  012737  100000  042340            MOV   #100000,@#TEMP1
046650  005337  042342                    DEC   @#TEMP2           ;100000 -2 SHIFTED BY 15.
046654  005037  042350                    CLR   @#TEMP5           ;IS EQUAL TO 77777 0
046660  012737  000002  042352            MOV   #2,@#TEMP6        ;AND PS=2
046666  000207                            RTS   %7
046670  021527  000175           TST175:  CMP   (R5),#175         ;IS IT TEST 175?
046674  001015                            BNE   ENT176            ;IF NOT THEN TRY TEST 176
046676  012737  177777  042340            MOV   #-1,@#TEMP1
046704  005037  042342                    CLR   @#TEMP2           ;-1 0
046710  005237  042344                    INC   @#TEMP3           ;SHIFTED BY 16.
046714  005037  042346                    CLR   @#TEMP4           ;IS EQUAL TO 0 0
046720  012737  000007  042352            MOV   #7,@#TEMP6        ;AND PS=7
046726  000207                            RTS   %7
046730  021527  000176           ENT176:  CMP   (R5),#176         ;IS THE PROGRM ENTERING TEST 176?
046734  001403                            BEQ   .+10
046736  004767  011650                    JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;TEST NUMBER GOOFED
046742  000056                            56              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)
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046744  005726                          TST     (SP)+                   ;RESTORE STACK POINTER

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

046746  010767  131220          TST176: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
046752  012701  000000                  MOV     #DUMMY,%1               ;LOAD R1 WITH DUMMY
046756  012701  000001                  MOV     #1,%1!1                 ;LOAD R1!1 WITH 1
046762  000241                          CLC
046764  073127  000010                  ASHC    #8.,%1                  ;SHIFT R1,R1!1 BY 8.
046770  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
046774  122737  000000  042336          CMPB    #0,@#PSWORD             ;IS THE PS 0?
047002  001403                          BEQ     .+10
047004  004767  011602                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 0
047010  000057                          57                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047012  022701  000400                  CMP     #400,%1                 ;IS THE RESULT 400?
047016  001403                          BEQ     .+10
047020  004767  011566                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R1 IS NOT EQUAL TO 400
047024  000060                          60                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047026  021527  000176                  CMP     (R5),#176                       ;IS $TESTN = #176?
047032  001403                          BEQ     .+10                    ;IF NOT THEN GO TO HLT
047034  004767  011552                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
047040  000061                          61                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047042  005215                          INC     (R5)



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

047044  010767  131122          TST177: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
047050  012703  000000                  MOV     #DUMMY,%3               ;LOAD R3 WITH DUMMY
047054  012703  177777                  MOV     #-1,%3!1                ;LOAD R3!1 WITH -1
047060  000241                          CLC
047062  073327  000017                  ASHC    #15.,%3                 ;SHIFT R3,R3!1 BY 15.
047066  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
047072  122737  000011  042336          CMPB    #11,@#PSWORD            ;IS THE PS 11?
047100  001403                          BEQ     .+10
047102  004767  011504                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
047106  000062                          62                      ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

047110  022703  100000                  CMP     #100000,%3              ;IS THE RESULT 100000?
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```
047114  001403                          BEQ     .+10
047116  004767  011470                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R3 IS NOT EQUAL TO 100000
047122  000063                          63              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047124  021527  000177                  CMP     (R5),#177               ;IS $TESTN = #177?
047130  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047132  004767  011454                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047136  000064                          64              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047140  005215                          INC     (R5)



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

047142  010767  131024          TST200: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047146  010501                          MOV     R5,R1           ;SAVE R5
047150  012705  000000                  MOV     #DUMMY,%5       ;LOAD R5 WITH DUMMY
047154  012705  052525                  MOV     #52525,%5!1     ;LOAD R5!1 WITH 52525
047160  000241                          CLC
047162  073527  000000                  ASHC    #0,%5           ;SHIFT R5,R5!1 BY 0
047166  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
047172  122737  000000  042336          CMPB    #0,@#PSWORD     ;IS THE PS 0?
047200  001403                          BEQ     .+10
047202  004767  011404                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 0
047206  000065                          65              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047210  022705  052525                  CMP     #52525,%5       ;IS THE RESULT 52525?
047214  001403                          BEQ     .+10
047216  004767  011370                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R5 IS NOT EQUAL TO 52525
047222  000066                          66              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047224  010105                          MOV     R1,R5           ;RESTORE R5
047226  021527  000200                  CMP     (R5),#200               ;IS $TESTN = #200?
047232  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047234  004767  011352                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047240  000067                          67              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047242  005215                          INC     (R5)



                                ;*****************************************************************
                                ;TEST:201       20010 SHIFTED BY -13. = 101  PS = 0
                                ;*****************************************************************
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```
047244 010767 130722           TST201: MOV   PC,LPADR          ;STORE ERROR LOOP ADDRESS
047250 012701 000000                   MOV   #DUMMY,%1         ;LOAD R1 WITH DUMMY
047254 012701 020010                   MOV   #20010,%1!1       ;LOAD R1!1 WITH 20010
047260 000241                          CLC
047262 073127 177763                   ASHC  #-13.,%1          ;SHIFT R1,R1!1 BY -13.
047266 106737 042336                   MFPS  @#PSWORD          ;SAVE PS
047272 122737 000000 042336            CMPB  #0,@#PSWORD       ;IS THE PS 0?
047300 001403                          BEQ   .+10
047302 004767 011304                   JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
047306 000070                          70               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047310 022701 000101                   CMP   #101,%1           ;IS THE RESULT 101?
047314 001403                          BEQ   .+10
047316 004767 011270                   JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R1 IS NOT EQUAL TO 101
047322 000071                          71               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047324 021527 000201                   CMP   (R5),#201                  ;IS $TESTN = #201?
047330 001403                          BEQ   .+10              ;IF NOT THEN GO TO HLT
047332 004767 011254                   JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
047336 000072                          72               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047340 005215                          INC   (R5)


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

047342 010767 130624           TST202: MOV   PC,LPADR          ;STORE ERROR LOOP ADDRESS
047346 012703 000000                   MOV   #DUMMY,%3         ;LOAD R3 WITH DUMMY
047352 012703 177777                   MOV   #-1,%3!1          ;LOAD R3!1 WITH -1
047356 000241                          CLC
047360 073327 000020                   ASHC  #16.,%3           ;SHIFT R3,R3!1 BY 16.
047364 106737 042336                   MFPS  @#PSWORD          ;SAVE PS
047370 122737 000011 042336            CMPB  #11,@#PSWORD      ;IS THE PS 11?
047376 001403                          BEQ   .+10
047400 004767 011206                   JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 11
047404 000073                          73               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047406 022703 000000                   CMP   #0,%3             ;IS THE RESULT 0?
047412 001403                          BEQ   .+10
047414 004767 011172                   JSR   PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R3 IS NOT EQUAL TO 0
047420 000074                          74               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047422 021527 000202                   CMP   (R5),#202                  ;IS $TESTN = #202?
047426 001403                          BEQ   .+10              ;IF NOT THEN GO TO HLT
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047430  004767  011156                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047434  000075                          75              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047436  005215                          INC     (R5)


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

047440  010767  130526          TST203: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
047444  010501                          MOV     R5,R1                   ;SAVE R5
047446  012705  000000                  MOV     #DUMMY,%5               ;LOAD R5 WITH DUMMY
047452  012705  000001                  MOV     #1,%5!1                 ;LOAD R5!1 WITH 1
047456  000241                          CLC
047460  073527  177777                  ASHC    #-1,%5                  ;SHIFT R5,R5!1 BY -1
047464  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
047470  122737  000001  042336          CMPB    #1,@#PSWORD             ;IS THE PS 1?
047476  001403                          BEQ     .+10
047500  004767  011106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 1
047504  000076                          76              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047506  022705  100000                  CMP     #100000,%5              ;IS THE RESULT 100000?
047512  001403                          BEQ     .+10
047514  004767  011072                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R5 IS NOT EQUAL TO 100000
047520  000077                          77              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047522  010105                          MOV     R1,R5                   ;RESTORE R5
047524  021527  000203                  CMP     (R5),#203                       ;IS $TESTN = #203?
047530  001403                          BEQ     .+10                    ;IF NOT THEN GO TO HLT
047532  004767  011054                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
047536  000100                          100             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

047540  005215                          INC     (R5)


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

047542  010767  130424          TST204: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
047546  012701  000000                  MOV     #DUMMY,%1               ;LOAD R1 WITH DUMMY
047552  012701  125252                  MOV     #125252,%1!1            ;LOAD R1!1 WITH 125252
047556  000241                          CLC
047560  073127  177760                  ASHC    #-16.,%1                ;SHIFT R1,R1!1 BY -16.
047564  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
047570  122737  000011  042336          CMPB    #11,@#PSWORD            ;IS THE PS 11?
047576  001403                          BEQ     .+10
```

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047600  004767  011006                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 11
047604  000101                          101             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
047606  022701  125252                  CMP     #125252,%1      ;IS THE RESULT 125252?
047612  001403                          BEQ     .+10
047614  004767  010772                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R1 IS NOT EQUAL TO 125252
047620  000102                          102             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
047622  021527  000204                  CMP     (R5),#204               ;IS $TESTN = #204?
047626  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047630  004767  010756                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
047634  000103                          103             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
047636  005215                          INC     (R5)

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

047640  010767  130326          TST205: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
047644  012702  125252                  MOV     #125252,%2      ;LOAD R2 WITH 125252
047650  012703  125252                  MOV     #125252,%2!1    ;LOAD R2!1 WITH 125252
047654  000241                          CLC
047656  073227  000025                  ASHC    #21.,%2         ;SHIFT R2,R2!1 BY 21.
047662  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
047666  122737  000003  042336          CMPB    #3,@#PSWORD     ;IS THE PS 3?
047674  001403                          BEQ     .+10
047676  004767  010710                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 3
047702  000104                          104             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
047704  022702  052500                  CMP     #52500,%2       ;IS THE RESULT 52500?
047710  001403                          BEQ     .+10
047712  004767  010674                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R2 IS NOT EQUAL TO 52500
047716  000105                          105             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
047720  022703  000000                  CMP     #000000,%2!1    ;IS THE RESULT 000000?
047724  001403                          BEQ     .+10
047726  004767  010660                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R2!1 IS NOT EQUAL TO 000000
047732  000106                          106             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
047734  021527  000205                  CMP     (R5),#205               ;IS $TESTN = #205?
047740  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
047742  004767  010644                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

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                                                               ;TEST IS IN WRONG SEQUENCE
 047746  000107                        107                  ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

 047750  005215                        INC     (R5)



 047752  012702  177771                MOV     #-7,%2
 047756  012703  042360                MOV     #S1,%3
 047762  012704  042362                MOV     #S2,%4

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

 047766  010767  130200        TST206: MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
 047772  012700  125252                MOV     #125252,%0               ;LOAD R0 WITH 125252
 047776  012701  125252                MOV     #125252,%0!1     ;LOAD R0!1 WITH 125252
 050002  000241                        CLC
 050004  073067  172350                ASHC    S1,%0            ;SHIFT R0,R0!1 BY S1
 050010  106737  042336                MFPS    @#PSWORD         ;SAVE PS
 050014  122737  000010  042336        CMPB    #10,@#PSWORD     ;IS THE PS 10?
 050022  001403                        BEQ     .+10
 050024  004767  010562                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
 050030  000110                        110                  ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

 050032  022700  177525                CMP     #177525,%0       ;IS THE RESULT 177525?
 050036  001403                        BEQ     .+10
 050040  004767  010546                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
 050044  000111                        111                  ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

 050046  022701  052525                CMP     #52525,%0!1      ;IS THE RESULT 52525?
 050052  001403                        BEQ     .+10
 050054                        1$:
 050054  004767  010532                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
 050060  000112                        112                  ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

 050062  021527  000206                CMP     (R5),#206                ;IS THE $TESTN = #206?
 050066  001372                        BNE     1$               ;IF NOT THEN GO TO HLT ABOVE
 050070  005215                        INC     (R5)


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

 050072  010767  130074        TST207: MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
 050076  012700  125252                MOV     #125252,%0               ;LOAD R0 WITH 125252
 050102  012701  125252                MOV     #125252,%0!1     ;LOAD R0!1 WITH 125252
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```
050106  000241                          CLC
050110  073077  172246                  ASHC    @S2,%0          ;SHIFT R0,R0!1 BY @S2
050114  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
050120  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050126  001403                          BEQ     .+10
050130  004767  010456                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
050134  000113                          113             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050136  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050142  001403                          BEQ     .+10
050144  004767  010442                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525
050150  000114                          114             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050152  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
050156  001403                          BEQ     .+10
050160                          1$:
050160  004767  010426                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050164  000115                          115             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050166  021527  000207                  CMP     (R5),#207               ;IS THE $TESTN = #207?
050172  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050174  005215                          INC     (R5)


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

050176  010767  127770          TST210: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050202  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050206  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050212  000241                          CLC
050214  073037  042360                  ASHC    @#S1,%0         ;SHIFT R0,R0!1 BY @#S1
050220  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
050224  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050232  001403                          BEQ     .+10
050234  004767  010352                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
050240  000116                          116             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050242  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050246  001403                          BEQ     .+10
050250  004767  010336                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525
050254  000117                          117             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050256  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
050262  001403                          BEQ     .+10
```

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050264                              1$:
050264  004767  010322                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050270  000120                              120                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050272  021527  000210                      CMP     (R5),#210               ;IS THE $TESTN = #210?
050276  001372                              BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050300  005215                              INC     (R5)


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

050302  010767  127664              TST211: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050306  012700  125252                      MOV     #125252,%0              ;LOAD R0 WITH 125252
050312  012701  125252                      MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050316  000241                              CLC
050320  073013                              ASHC    (3),%0          ;SHIFT R0,R0!1 BY (3)
050322  106737  042336                      MFPS    @#PSWORD        ;SAVE PS
050326  122737  000010  042336              CMPB    #10,@#PSWORD    ;IS THE PS 10?
050334  001403                              BEQ     .+10
050336  004767  010250                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;THE PS IS NOT EQUAL TO 10
050342  000121                              121                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050344  022700  177525                      CMP     #177525,%0      ;IS THE RESULT 177525?
050350  001403                              BEQ     .+10
050352  004767  010234                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;R0 IS NOT EQUAL TO 177525
050356  000122                              122                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050360  022701  052525                      CMP     #52525,%0!1     ;IS THE RESULT 52525?
050364  001403                              BEQ     .+10
050366                              1$:
050366  004767  010220                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050372  000123                              123                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

050374  021527  000211                      CMP     (R5),#211               ;IS THE $TESTN = #211?
050400  001372                              BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050402  005215                              INC     (R5)


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

050404  010767  127562              TST212: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050410  012700  125252                      MOV     #125252,%0              ;LOAD R0 WITH 125252
050414  012701  125252                      MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050420  000241                              CLC
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```
050422  073023                          ASHC    (3)+,%0         ;SHIFT R0,R0!1 BY (3)+
050424  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
050430  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050436  001403                          BEQ     .+10
050440  004767  010146                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
050444  000124                          124             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
050446  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050452  001403                          BEQ     .+10
050454  004767  010132                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525
050460  000125                          125             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
050462  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
050466  001403                          BEQ     .+10
050470                          1$:
050470  004767  010116                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050474  000126                          126             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
050476  021527  000212                  CMP     (R5),#212               ;IS THE $TESTN = #212?
050502  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050504  005215                          INC     (R5)

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

050506  010767  127460          TST213: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050512  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050516  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050522  000241                          CLC
050524  073043                          ASHC    -(3),%0         ;SHIFT R0,R0!1 BY -(3)
050526  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
050532  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050540  001403                          BEQ     .+10
050542  004767  010044                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
050546  000127                          127             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
050550  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050554  001403                          BEQ     .+10
050556  004767  010030                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525
050562  000130                          130             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
050564  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
050570  001403                          BEQ     .+10
050572                          1$:
```

```
050572  004767  010014                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
050576  000131                          131             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050600  021527  000213                  CMP     (R5),#213               ;IS THE $TESTN = #213?
050604  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050606  005215                          INC     (R5)


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

050610  010767  127356          TST214: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050614  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050620  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050624  000241                          CLC
050626  073064  000002                  ASHC    2(4),%0         ;SHIFT R0,R0!1 BY 2(4)
050632  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
050636  122737  000011  042336          CMPB    #11,@#PSWORD    ;IS THE PS 11?
050644  001403                          BEQ     .+10
050646  004767  007740                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 11
050652  000132                          132             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050654  022700  177252                  CMP     #177252,%0      ;IS THE RESULT 177252?
050660  001403                          BEQ     .+10
050662  004767  007724                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177252
050666  000133                          133             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050670  022701  125252                  CMP     #125252,%0!1    ;IS THE RESULT 125252?
050674  001403                          BEQ     .+10
050676                          1$:
050676  004767  007710                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 125252 OR INCORRECT SEQUENCE
050702  000134                          134             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050704  021527  000214                  CMP     (R5),#214               ;IS THE $TESTN = #214?
050710  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
050712  005215                          INC     (R5)


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

050714  010767  127252          TST215: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
050720  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
050724  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
050730  000241                          CLC
050732  073074  000000                  ASHC    @(4),%0         ;SHIFT R0,R0!1 BY @(4)
```

```
050736  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
050742  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS THE PS 10?
050750  001403                          BEQ     .+10
050752  004767  007634                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
050756  000135                          135             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050760  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
050764  001403                          BEQ     .+10
050766  004767  007620                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
050772  000136                          136             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

050774  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
051000  001403                          BEQ     .+10
051002                          1$:
051002  004767  007604                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051006  000137                          137             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051010  021527  000215                  CMP     (R5),#215               ;IS THE $TESTN = #215?
051014  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
051016  005215                          INC     (R5)


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

051020  010767  127146          TST216: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051024  012700  125252                  MOV     #125252,%0              ;LOAD R0 WITH 125252
051030  012701  125252                  MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
051034  000241                          CLC
051036  073034                          ASHC    @(4)+,%0                ;SHIFT R0,R0!1 BY @(4)+
051040  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
051044  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS THE PS 10?
051052  001403                          BEQ     .+10
051054  004767  007532                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
051060  000140                          140             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051062  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
051066  001403                          BEQ     .+10
051070  004767  007516                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525
051074  000141                          141             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051076  022701  052525                  CMP     #52525,%0!1     ;IS THE RESULT 52525?
051102  001403                          BEQ     .+10
051104                          1$:
051104  004767  007502                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
                                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051110  000142                                  142             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051112  021527  000216                          CMP     (R5),#216               ;IS THE $TESTN = #216?
051116  001372                                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
051120  005215                                  INC     (R5)


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

051122  010767  127044                  TST217: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051126  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
051132  012701  125252                          MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
051136  000241                                  CLC
051140  073054                                  ASHC    @-(4),%0                ;SHIFT R0,R0!1 BY @-(4)
051142  106737  042336                          MFPS    @#PSWORD        ;SAVE PS
051146  122737  000010  042336                  CMPB    #10,@#PSWORD    ;IS THE PS 10?
051154  001403                                  BEQ     .+10
051156  004767  007430                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
051162  000143                                  143             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051164  022700  177525                          CMP     #177525,%0      ;IS THE RESULT 177525?
051170  001403                                  BEQ     .+10
051172  004767  007414                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525
051176  000144                                  144             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051200  022701  052525                          CMP     #52525,%0!1     ;IS THE RESULT 52525?
051204  001403                                  BEQ     .+10
051206                                  1$:
051206  004767  007400                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
051212  000145                                  145             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051214  021527  000217                          CMP     (R5),#217               ;IS THE $TESTN = #217?
051220  001372                                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
051222  005215                                  INC     (R5)
```

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




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

051224  010767  126742                  TST220: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
051230  012700  000001                          MOV     #1,%0                   ;LOAD MULTIPLICAND WITH 1
051234  070027  000000                          MUL     #0,%0                   ;MULTIPLY 1 * #0
051240  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
051244  122737  000004  042336                  CMPB    #4,@#PSWORD             ;IS PS = 4
051252  001403                                  BEQ     .+10
051254  004767  007332                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
051260  000146                                  146                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY   (013746  000172  000207)

051262  022700  000000                          CMP     #0,%0                   ;IS HIGH ORDER = 0
051266  001403                                  BEQ     .+10
051270  004767  007316                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;HIGH ORDER IS WRONG
051274  000147                                  147                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY   (013746  000172  000207)

051276  022701  000000                          CMP     #0,%0!1                 ;IS LOW ORDER = 0
051302  001403                                  BEQ     .+10
051304                                  1$:
051304  004767  007302                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051310  000150                                  150                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY   (013746  000172  000207)

051312  021527  000220                          CMP     (R5),#220
051316  001372                                  BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051320  005215                                  INC     (R5)



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

051322  010767  126644                  TST221: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
051326  012700  177777                          MOV     #-1,%0                  ;LOAD MULTIPLICAND WITH -1
051332  070027  000001                          MUL     #1,%0                   ;MULTIPLY -1 * #1
051336  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
051342  122737  000010  042336                  CMPB    #10,@#PSWORD            ;IS PS = 10
051350  001403                                  BEQ     .+10
051352  004767  007234                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                                ;PS IS WRONG
051356  000151                                  151                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                        ;BY   (013746  000172  000207)
```

```
051360  022700  177777                  CMP     #-1,%0          ;IS HIGH ORDER = -1
051364  001403                          BEQ     .+10
051366  004767  007220                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
051372  000152                          152             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051374  022701  177777                  CMP     #-1,%0!1        ;IS LOW ORDER = -1
051400  001403                          BEQ     .+10
051402                          1$:
051402  004767  007204                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051406  000153                          153             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051410  021527  000221                  CMP     (R5),#221
051414  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051416  005215                          INC     (R5)


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

051420  010767  126546          TST222: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
051424  012702  000002                  MOV     #2,%2           ;LOAD MULTIPLICAND WITH 2
051430  070227  000002                  MUL     #2,%2           ;MULTIPLY 2 * #2
051434  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
051440  122737  000000  042336          CMPB    #0,@#PSWORD     ;IS PS = 0
051446  001403                          BEQ     .+10
051450  004767  007136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
051454  000154                          154             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051456  022702  000000                  CMP     #0,%2           ;IS HIGH ORDER = 0
051462  001403                          BEQ     .+10
051464  004767  007122                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
051470  000155                          155             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051472  022703  000004                  CMP     #4,%2!1         ;IS LOW ORDER = 4
051476  001403                          BEQ     .+10
051500                          1$:
051500  004767  007106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051504  000156                          156             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

051506  021527  000222                  CMP     (R5),#222
051512  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051514  005215                          INC     (R5)
```

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

051516  010767  126450                  TST223: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
051522  010501                                  MOV     R5,R1                   ;SAVE R5
051524  012704  001000                          MOV     #1000,%4                ;LOAD MULTIPLICAND WITH 1000
051530  070427  000200                          MUL     #200,%4                 ;MULTIPLY 1000 * #200
051534  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
051540  122737  000001  042336                  CMPB    #1,@#PSWORD             ;IS PS = 1
051546  001403                                  BEQ     .+10
051550  004767  007036                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
051554  000157                                  157                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

051556  022704  000001                          CMP     #1,%4                   ;IS HIGH ORDER = 1
051562  001403                                  BEQ     .+10
051564  004767  007022                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
051570  000160                                  160                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

051572  022705  000000                          CMP     #0,%4!1                 ;IS LOW ORDER = 0
051576  001403                                  BEQ     .+10
051600                                  1$:
051600  004767  007006                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051604  000161                                  161                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

051606  021127  000223                          CMP     (R1),#223                       ;CHECK THE TEST NUMBER
051612  001372                                  BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051614  010105                                  MOV     R1,R5                   ;RESTORE R5
051616  005215                                  INC     (R5)


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

051620  010767  126346                  TST224: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
051624  012700  000002                          MOV     #2,%0                   ;LOAD MULTIPLICAND WITH 2
051630  070027  077777                          MUL     #77777,%0               ;MULTIPLY 2 * #77777
051634  106737  042336                          MFPS    @#PSWORD                ;SAVE PS
051640  122737  000001  042336                  CMPB    #1,@#PSWORD             ;IS PS = 1
051646  001403                                  BEQ     .+10
051650  004767  006736                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
051654  000162                                  162                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                    ;BY  (013746  000172  000207)

051656  022700  000000                          CMP     #0,%0                   ;IS HIGH ORDER = 0
051662  001403                                  BEQ     .+10
051664  004767  006722                          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
```

```
051670  000163                          163                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051672  022701  177776                  CMP     #177776,%0!1      ;IS LOW ORDER = 177776
051676  001403                          BEQ     .+10
051700                          1$:
051700  004767  006706                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
051704  000164                          164                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051706  021527  000224                  CMP     (R5),#224
051712  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
051714  005215                          INC     (R5)



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

051716  010767  126250          TST225: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
051722  012702  007777                  MOV     #7777,%2          ;LOAD MULTIPLICAND WITH 7777.
051726  070227  000010                  MUL     #10,%2            ;MULTIPLY 7777 * #10
051732  106737  042336                  MFPS    @#PSWORD          ;SAVE PS
051736  122737  000000  042336          CMPB    #0,@#PSWORD       ;IS PS = 0
051744  001403                          BEQ     .+10
051746  004767  006640                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
051752  000165                          165                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051754  022702  000000                  CMP     #0,%2             ;IS HIGH ORDER = 0
051760  001403                          BEQ     .+10
051762  004767  006624                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
051766  000166                          166                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

051770  022703  077770                  CMP     #77770,%2!1       ;IS LOW ORDER = 77770
051774  001403                          BEQ     .+10
051776                          1$:
051776  004767  006610                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052002  000167                          167                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                ;BY  (013746  000172  000207)

052004  021527  000225                  CMP     (R5),#225
052010  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052012  005215                          INC     (R5)



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

052014  010767  126152          TST226: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
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```
052020  010501                            MOV     R5,R1               ;SAVE R5
052022  012704  077777                    MOV     #77777,%4           ;LOAD MULTIPLICAND WITH 77777
052026  070427  077777                    MUL     #77777,%4           ;MULTIPLY 77777 * #77777
052032  106737  042336                    MFPS    @#PSWORD            ;SAVE PS
052036  122737  000001  042336            CMPB    #1,@#PSWORD         ;IS PS = 1
052044  001403                            BEQ     .+10
052046  004767  006540                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;PS IS WRONG
052052  000170                            170               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

052054  022704  037777                    CMP     #37777,%4           ;IS HIGH ORDER = 37777
052060  001403                            BEQ     .+10
052062  004767  006524                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;HIGH ORDER IS WRONG
052066  000171                            171               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

052070  022705  000001                    CMP     #1,%4!1             ;IS LOW ORDER = 1
052074  001403                            BEQ     .+10
052076                            1$:
052076  004767  006510                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052102  000172                            172               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

052104  021127  000226                    CMP     (R1),#226                  ;CHECK THE TEST NUMBER
052110  001372                            BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052112  010105                            MOV     R1,R5               ;RESTORE R5
052114  005215                            INC     (R5)


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

052116  010767  126050            TST227: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
052122  012702  177777                    MOV     #-1,%2              ;LOAD MULTIPLICAND WITH -1
052126  070227  077777                    MUL     #77777,%2           ;MULTIPLY -1 * #77777
052132  106737  042336                    MFPS    @#PSWORD            ;SAVE PS
052136  122737  000010  042336            CMPB    #10,@#PSWORD        ;IS PS = 10
052144  001403                            BEQ     .+10
052146  004767  006440                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;PS IS WRONG
052152  000173                            173               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

052154  022702  177777                    CMP     #-1,%2              ;IS HIGH ORDER = -1
052160  001403                            BEQ     .+10
052162  004767  006424                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;HIGH ORDER IS WRONG
052166  000174                            174               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

052170  022703  100001                    CMP     #100001,%2!1        ;IS LOW ORDER = 100001
052174  001403                            BEQ     .+10
```

```
052176                          1$:
052176  004767  006410                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052202  000175                          175             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052204  021527  000227                  CMP     (R5),#227
052210  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052212  005215                          INC     (R5)
                                ;*************************************************************************
                                ;TEST:230       MUL     -2 * #77777 = -1 2          PS = 11
                                ;*************************************************************************
052214  010767  125752          TST230: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052220  012700  177776                  MOV     #-2,%0          ;LOAD MULTIPLICAND WITH -2
052224  070027  077777                  MUL     #77777,%0       ;MULTIPLY -2 * #77777
052230  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
052234  122737  000011  042336          CMPB    #11,@#PSWORD    ;IS PS = 11
052242  001403                          BEQ     .+10
052244  004767  006342                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052250  000176                          176             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052252  022700  177777                  CMP     #-1,%0          ;IS HIGH ORDER = -1
052256  001403                          BEQ     .+10
052260  004767  006326                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052264  000177                          177             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052266  022701  000002                  CMP     #2,%0!1         ;IS LOW ORDER = 2
052272  001403                          BEQ     .+10
052274                          1$:
052274  004767  006312                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052300  000200                          200             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052302  021527  000230                  CMP     (R5),#230
052306  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052310  005215                          INC     (R5)
                                ;*************************************************************************
                                ;TEST:231       MUL     125252 * #2 = -1 52524      PS = 11
                                ;*************************************************************************
052312  010767  125654          TST231: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052316  012702  125252                  MOV     #125252,%2      ;LOAD MULTIPLICAND WITH 125252
052322  070227  000002                  MUL     #2,%2           ;MULTIPLY 125252 * #2
052326  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
052332  122737  000011  042336          CMPB    #11,@#PSWORD    ;IS PS = 11
052340  001403                          BEQ     .+10
```

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052342  004767  006244                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052346  000201                          201             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052350  022702  177777                  CMP     #-1,%2          ;IS HIGH ORDER = -1
052354  001403                          BEQ     .+10
052356  004767  006230                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052362  000202                          202             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052364  022703  052524                  CMP     #52524,%2!1     ;IS LOW ORDER = 52524
052370  001403                          BEQ     .+10
052372                          1$:
052372  004767  006214                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052376  000203                          203             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052400  021527  000231                  CMP     (R5),#231
052404  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052406  005215                          INC     (R5)

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

052410  010767  125556          TST232: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052414  010501                          MOV     R5,R1           ;SAVE R5
052416  012704  125252                  MOV     #125252,%4      ;LOAD MULTIPLICAND WITH 125252
052422  070427  040000                  MUL     #40000,%4       ;MULTIPLY 125252 * #40000
052426  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
052432  122737  000011  042336          CMPB    #11,@#PSWORD    ;IS PS = 11
052440  001403                          BEQ     .+10
052442  004767  006144                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052446  000204                          204             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052450  022704  165252                  CMP     #165252,%4      ;IS HIGH ORDER = 165252
052454  001403                          BEQ     .+10
052456  004767  006130                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052462  000205                          205             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
052464  022705  100000                  CMP     #100000,%4!1    ;IS LOW ORDER = 100000
052470  001403                          BEQ     .+10
052472                          1$:
052472  004767  006114                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052476  000206                          206             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
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052500  021127  000232                  CMP     (R1),#232               ;CHECK THE TEST NUMBER
052504  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052506  010105                          MOV     R1,R5                   ;RESTORE R5
052510  005215                          INC     (R5)



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

052512  010767  125454          TST233: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
052516  012700  107070                  MOV     #107070,%0              ;LOAD MULTIPLICAND WITH 107070
052522  070027  107070                  MUL     #107070,%0              ;MULTIPLY 107070 * #107070
052526  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
052532  122737  000001  042336          CMPB    #1,@#PSWORD             ;IS PS = 1
052540  001403                          BEQ     .+10
052542  004767  006044                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
052546  000207                          207             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052550  022700  031222                  CMP     #31222,%0               ;IS HIGH ORDER = 31222
052554  001403                          BEQ     .+10
052556  004767  006030                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
052562  000210                          210             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052564  022701  026100                  CMP     #26100,%0!1             ;IS LOW ORDER = 26100
052570  001403                          BEQ     .+10
052572                          1$:
052572  004767  006014                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052576  000211                          211             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052600  021527  000233                  CMP     (R5),#233
052604  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052606  005215                          INC     (R5)


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

052610  010767  125356          TST234: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
052614  012701  177777                  MOV     #-1,%1                  ;LOAD MULTIPLICAND WITH -1
052620  070127  000001                  MUL     #1,%1                   ;MULTIPLY -1 * #1
052624  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
052630  122737  000010  042336          CMPB    #10,@#PSWORD            ;IS PS = 10
052636  001403                          BEQ     .+10
052640  004767  005746                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
052644  000212                          212             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
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052646  022701  177777                  CMP     #-1,%1          ;IS HIGH ORDER = -1
052652  001403                          BEQ     .+10
052654  004767  005732                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052660  000213                          213             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052662  022701  177777                  CMP     #-1,%1!1        ;IS LOW ORDER = -1
052666  001403                          BEQ     .+10
052670                          1$:
052670  004767  005716                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052674  000214                          214             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052676  021527  000234                  CMP     (R5),#234
052702  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
052704  005215                          INC     (R5)


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

052706  010767  125260          TST235: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
052712  012703  177777                  MOV     #-1,%3          ;LOAD MULTIPLICAND WITH -1
052716  070327  000000                  MUL     #0,%3           ;MULTIPLY -1 * #0
052722  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
052726  122737  000004  042336          CMPB    #4,@#PSWORD     ;IS PS = 4
052734  001403                          BEQ     .+10
052736  004767  005650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
052742  000215                          215             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052744  022703  000000                  CMP     #0,%3           ;IS HIGH ORDER = 0
052750  001403                          BEQ     .+10
052752  004767  005634                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
052756  000216                          216             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052760  022703  000000                  CMP     #0,%3!1         ;IS LOW ORDER = 0
052764  001403                          BEQ     .+10
052766                          1$:
052766  004767  005620                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
052772  000217                          217             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

052774  021527  000235                  CMP     (R5),#235
053000  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053002  005215                          INC     (R5)


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

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

053004  010767  125162            TST236: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
053010  010501                            MOV     R5,R1             ;SAVE R5
053012  012705  077777                    MOV     #77777,%5         ;LOAD MULTIPLICAND WITH 77777
053016  070527  100000                    MUL     #100000,%5        ;MULTIPLY 77777 * #100000
053022  106737  042336                    MFPS    @#PSWORD          ;SAVE PS
053026  122737  000011  042336            CMPB    #11,@#PSWORD      ;IS PS = 11
053034  001403                            BEQ     .+10
053036  004767  005550                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;PS IS WRONG
053042  000220                            220               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

053044  022705  100000                    CMP     #100000,%5        ;IS HIGH ORDER = 100000
053050  001403                            BEQ     .+10
053052  004767  005534                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;HIGH ORDER IS WRONG
053056  000221                            221               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

053060  022705  100000                    CMP     #100000,%5!1      ;IS LOW ORDER = 100000
053064  001403                            BEQ     .+10
053066                            1$:
053066  004767  005520                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053072  000222                            222               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

053074  021127  000236                    CMP     (R1),#236                 ;CHECK THE TEST NUMBER
053100  001372                            BNE     1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053102  010105                            MOV     R1,R5             ;RESTORE R5
053104  005215                            INC     (R5)


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

053106  010767  125060            TST237: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
053112  012701  177777                    MOV     #-1,%1            ;LOAD MULTIPLICAND WITH -1
053116  070127  077777                    MUL     #77777,%1         ;MULTIPLY -1 * #77777
053122  106737  042336                    MFPS    @#PSWORD          ;SAVE PS
053126  122737  000010  042336            CMPB    #10,@#PSWORD      ;IS PS = 10
053134  001403                            BEQ     .+10
053136  004767  005450                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;PS IS WRONG
053142  000223                            223               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

053144  022701  100001                    CMP     #100001,%1        ;IS HIGH ORDER = 100001
053150  001403                            BEQ     .+10
053152  004767  005434                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;HIGH ORDER IS WRONG
053156  000224                            224               ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
```

```
                                                                        ;BY  (013746  000172  000207)
053160  022701  100001                   CMP     #100001,%1!1         ;IS LOW ORDER = 100001
053164  001403                           BEQ     .+10
053166                           1$:
053166  004767  005420                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053172  000225                           225             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                         ;BY  (013746  000172  000207)
053174  021527  000237                   CMP     (R5),#237
053200  001372                           BNE     1$                   ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053202  005215                           INC     (R5)

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

053204  010767  124762           TST240: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
053210  012703  077777                   MOV     #77777,%3            ;LOAD MULTIPLICAND WITH 77777
053214  070327  077777                   MUL     #77777,%3            ;MULTIPLY 77777 * #77777
053220  106737  042336                   MFPS    @#PSWORD             ;SAVE PS
053224  122737  000001  042336           CMPB    #1,@#PSWORD          ;IS PS = 1
053232  001403                           BEQ     .+10
053234  004767  005352                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
053240  000226                           226             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                         ;BY  (013746  000172  000207)
053242  022703  000001                   CMP     #1,%3                ;IS HIGH ORDER = 1
053246  001403                           BEQ     .+10
053250  004767  005336                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
053254  000227                           227             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                         ;BY  (013746  000172  000207)
053256  022703  000001                   CMP     #1,%3!1              ;IS LOW ORDER = 1
053262  001403                           BEQ     .+10
053264                           1$:
053264  004767  005322                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053270  000230                           230             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                         ;BY  (013746  000172  000207)
053272  021527  000240                   CMP     (R5),#240
053276  001372                           BNE     1$                   ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053300  005215                           INC     (R5)

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

053302  010767  124664           TST241: MOV     PC,LPADR             ;STORE ERROR LOOP ADDRESS
053306  010501                           MOV     R5,R1                ;SAVE R5
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```
053310  012705  000002                  MOV     #2,%5                   ;LOAD MULTIPLICAND WITH 2
053314  070527  000002                  MUL     #2,%5                   ;MULTIPLY 2 * #2
053320  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
053324  122737  000000  042336          CMPB    #0,@#PSWORD             ;IS PS = 0
053332  001403                          BEQ     .+10
053334  004767  005252                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
053340  000231                          231                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053342  022705  000004                  CMP     #4,%5                   ;IS HIGH ORDER = 4
053346  001403                          BEQ     .+10
053350  004767  005236                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
053354  000232                          232                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053356  022705  000004                  CMP     #4,%5!1                 ;IS LOW ORDER = 4
053362  001403                          BEQ     .+10
053364                          1$:
053364  004767  005222                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053370  000233                          233                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053372  021127  000241                  CMP     (R1),#241                       ;CHECK THE TEST NUMBER
053376  001372                          BNE     1$                      ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053400  010105                          MOV     R1,R5                   ;RESTORE R5
053402  005215                          INC     (R5)


053404  012702  040000                  MOV     #40000,%2
053410  012703  042370                  MOV     #S5,%3
053414  012704  042372                  MOV     #S6,%4

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

053420  010767  124546          TST242: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
053424  012700  125252                  MOV     #125252,%0              ;LOAD MULTIPLICAND WITH 125252
053430  070067  166734                  MUL     S5,%0                   ;MULTIPLY 125252 * S5
053434  106737  042336                  MFPS    @#PSWORD                ;SAVE PS
053440  122737  000011  042336          CMPB    #11,@#PSWORD            ;IS PS = 11
053446  001403                          BEQ     .+10
053450  004767  005136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
053454  000234                          234                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)

053456  022700  165252                  CMP     #165252,%0              ;IS HIGH ORDER = 165252
053462  001403                          BEQ     .+10
053464  004767  005122                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
053470  000235                          235                     ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                                ;BY  (013746  000172  000207)
```

```
053472  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER = 100000
053476  001403                          BEQ     .+10
053500                          1$:
053500  004767  005106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053504  000236                          236             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053506  021527  000242                  CMP     (R5),#242
053512  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053514  005215                          INC     (R5)


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

053516  010767  124450          TST243: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053522  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
053526  070077  166640                  MUL     @S6,%0          ;MULTIPLY 125252 * @S6
053532  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
053536  122737  000011  042336          CMPB    #11,@#PSWORD    ;IS PS = 11
053544  001403                          BEQ     .+10
053546  004767  005040                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
053552  000237                          237             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053554  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
053560  001403                          BEQ     .+10
053562  004767  005024                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
053566  000240                          240             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053570  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER = 100000
053574  001403                          BEQ     .+10
053576                          1$:
053576  004767  005010                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053602  000241                          241             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053604  021527  000243                  CMP     (R5),#243
053610  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053612  005215                          INC     (R5)


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

053614  010767  124352          TST244: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
053620  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
053624  070037  042370                  MUL     @#S5,%0         ;MULTIPLY 125252 * @#S5
```

```
053630  106737  042336                   MFPS    @#PSWORD          ;SAVE PS
053634  122737  000011  042336           CMPB    #11,@#PSWORD      ;IS PS = 11
053642  001403                           BEQ     .+10
053644  004767  004742                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;PS IS WRONG
053650  000242                           242            ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053652  022700  165252                   CMP     #165252,%0        ;IS HIGH ORDER = 165252
053656  001403                           BEQ     .+10
053660  004767  004726                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;HIGH ORDER IS WRONG
053664  000243                           243            ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053666  022701  100000                   CMP     #100000,%0!1      ;IS LOW ORDER = 100000
053672  001403                           BEQ     .+10
053674                           1$:
053674  004767  004712                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053700  000244                           244            ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053702  021527  000244                   CMP     (R5),#244
053706  001372                           BNE     1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
053710  005215                           INC     (R5)



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

053712  010767  124254           TST245: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
053716  012700  125252                   MOV     #125252,%0        ;LOAD MULTIPLICAND WITH 125252
053722  070002                           MUL     %2,%0             ;MULTIPLY 125252 * %2
053724  106737  042336                   MFPS    @#PSWORD          ;SAVE PS
053730  122737  000011  042336           CMPB    #11,@#PSWORD      ;IS PS = 11
053736  001403                           BEQ     .+10
053740  004767  004646                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;PS IS WRONG
053744  000245                           245            ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053746  022700  165252                   CMP     #165252,%0        ;IS HIGH ORDER = 165252
053752  001403                           BEQ     .+10
053754  004767  004632                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;HIGH ORDER IS WRONG
053760  000246                           246            ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

053762  022701  100000                   CMP     #100000,%0!1      ;IS LOW ORDER = 100000
053766  001403                           BEQ     .+10
053770                           1$:
053770  004767  004616                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;LOW ORDER IS WRONG OR WRONG SEQUENCE
053774  000247                           247            ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
```

```
                                                           ;BY  (013746  000172  000207)

054776  021527  000245                 CMP     (R5),#245
054002  001372                         BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054004  005215                         INC     (R5)


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

054006  010767  124160         TST246: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
054012  012700  125252                 MOV     #125252,%0          ;LOAD MULTIPLICAND WITH 125252
054016  070023                         MUL     (3)+,%0             ;MULTIPLY 125252 * (3)+
054020  106737  042336                 MFPS    @#PSWORD            ;SAVE PS
054024  122737  000011  042336         CMPB    #11,@#PSWORD        ;IS PS = 11
054032  001403                         BEQ     .+10
054034  004767  004552                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;PS IS WRONG
054040  000250                         250             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

054042  022700  165252                 CMP     #165252,%0          ;IS HIGH ORDER = 165252
054046  001403                         BEQ     .+10
054050  004767  004536                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;HIGH ORDER IS WRONG
054054  000251                         251             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

054056  022701  100000                 CMP     #100000,%0!1        ;IS LOW ORDER = 100000
054062  001403                         BEQ     .+10
054064                         1$:
054064  004767  004522                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054070  000252                         252             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

054072  021527  000246                 CMP     (R5),#246
054076  001372                         BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054100  005215                         INC     (R5)


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

054102  010767  124064         TST247: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
054106  012700  125252                 MOV     #125252,%0          ;LOAD MULTIPLICAND WITH 125252
054112  070043                         MUL     -(3),%0             ;MULTIPLY 125252 * -(3)
054114  106737  042336                 MFPS    @#PSWORD            ;SAVE PS
054120  122737  000011  042336         CMPB    #11,@#PSWORD        ;IS PS = 11
054126  001403                         BEQ     .+10
054130  004767  004456                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;PS IS WRONG
054134  000253                         253             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)
```

```
054136  022700  165252                      CMP     #165252,%0          ;IS HIGH ORDER = 165252
054142  001403                              BEQ     .+10
054144  004767  004442                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
054150  000254                              254             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

054152  022701  100000                      CMP     #100000,%0!1        ;IS LOW ORDER = 100000
054156  001403                              BEQ     .+10
054160                              1$:
054160  004767  004426                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054164  000255                              255             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

054166  021527  000247                      CMP     (R5),#247
054172  001372                              BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054174  005215                              INC     (R5)


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

054176  010767  123770              TST250: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
054202  012700  125252                      MOV     #125252,%0          ;LOAD MULTIPLICAND WITH 125252
054206  070064  000002                      MUL     2(4),%0             ;MULTIPLY 125252 * 2(4)
054212  106737  042336                      MFPS    @#PSWORD            ;SAVE PS
054216  122737  000011  042336              CMPB    #11,@#PSWORD        ;IS PS = 11
054224  001403                              BEQ     .+10
054226  004767  004360                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
054232  000256                              256             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

054234  022700  165252                      CMP     #165252,%0          ;IS HIGH ORDER = 165252
054240  001403                              BEQ     .+10
054242  004767  004344                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
054246  000257                              257             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

054250  022701  100000                      CMP     #100000,%0!1        ;IS LOW ORDER = 100000
054254  001403                              BEQ     .+10
054256                              1$:
054256  004767  004330                      JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054262  000260                              260             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)

054264  021527  000250                      CMP     (R5),#250
054270  001372                              BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054272  005215                              INC     (R5)
```

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

054274  010767  123672             TST251: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
054300  012700  125252                     MOV     #125252,%0        ;LOAD MULTIPLICAND WITH 125252
054304  070074  000000                     MUL     @(4),%0           ;MULTIPLY 125252 * @(4)
054310  106737  042336                     MFPS    @#PSWORD          ;SAVE PS
054314  122737  000011  042336             CMPB    #11,@#PSWORD      ;IS PS = 11
054322  001403                             BEQ     .+10
054324  004767  004262                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;PS IS WRONG
054330  000261                             261             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

054332  022700  165252                     CMP     #165252,%0        ;IS HIGH ORDER = 165252
054336  001403                             BEQ     .+10
054340  004767  004246                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;HIGH ORDER IS WRONG
054344  000262                             262             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

054346  022701  100000                     CMP     #100000,%0!1      ;IS LOW ORDER = 100000
054352  001403                             BEQ     .+10
054354                             1$:
054354  004767  004232                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054360  000263                             263             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

054362  021527  000251                     CMP     (R5),#251
054366  001372                             BNE     1$                ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054370  005215                             INC     (R5)


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

054372  010767  123574             TST252: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
054376  012700  125252                     MOV     #125252,%0        ;LOAD MULTIPLICAND WITH 125252
054402  070034                             MUL     @(4)+,%0          ;MULTIPLY 125252 * @(4)+
054404  106737  042336                     MFPS    @#PSWORD          ;SAVE PS
054410  122737  000011  042336             CMPB    #11,@#PSWORD      ;IS PS = 11
054416  001403                             BEQ     .+10
054420  004767  004166                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;PS IS WRONG
054424  000264                             264             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)

054426  022700  165252                     CMP     #165252,%0        ;IS HIGH ORDER = 165252
054432  001403                             BEQ     .+10
054434  004767  004152                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                             ;HIGH ORDER IS WRONG
054440  000265                             265             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                           ;BY  (013746  000172  000207)
```

```
054442  022701  100000                  CMP     #100000,%0!1       ;IS LOW ORDER = 100000
054446  001403                          BEQ     .+10
054450                          1$:
054450  004767  004136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054454  000266                          266             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054456  021527  000252                  CMP     (R5),#252
054462  001372                          BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054464  005215                          INC     (R5)


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

054466  010767  123500          TST253: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
054472  012700  125252                  MOV     #125252,%0         ;LOAD MULTIPLICAND WITH 125252
054476  070054                          MUL     @-(4),%0           ;MULTIPLY 125252 * @-(4)
054500  106737  042336                  MFPS    @#PSWORD           ;SAVE PS
054504  122737  000011  042336          CMPB    #11,@#PSWORD       ;IS PS = 11
054512  001403                          BEQ     .+10
054514  004767  004072                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
054520  000267                          267             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054522  022700  165252                  CMP     #165252,%0         ;IS HIGH ORDER = 165252
054526  001403                          BEQ     .+10
054530  004767  004056                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;HIGH ORDER IS WRONG
054534  000270                          270             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054536  022701  100000                  CMP     #100000,%0!1       ;IS LOW ORDER = 100000
054542  001403                          BEQ     .+10
054544                          1$:
054544  004767  004042                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
054550  000271                          271             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

054552  021527  000253                  CMP     (R5),#253
054556  001372                          BNE     1$                  ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
054560  005215                          INC     (R5)
```

```
                                                   ;*********************************
                                                   ;       DIV INSTRUCTION TESTS
                                                   ;*********************************
                                   ;*********************************************************************
                                   ;TEST:254     DIV     0 4 / #2 = 2       REM = 0       PS = 0
                                   ;*********************************************************************
054562  010767  123404             TST254: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
054566  012700  000000                     MOV     #0,%0              ;LOAD HIGH ORDER WITH 0
054572  012701  000004                     MOV     #4,%0+1            ;LOAD LOW ORDER WITH 4
054576  071027  000002                     DIV     #2,%0              ;DIVIDE BY #2
054602  106737  042336                     MFPS    @#PSWORD           ;SAVE PS
054606  122737  000000  042336             CMPB    #0,@#PSWORD        ;IS PS = 0
054614  001403                             BEQ     .+10
054616  004767  003770                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;PS IS WRONG
054622  000272                             272              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)
054624  022700  000002                     CMP     #2,%0              ;IS QUOTIENT = 2
054630  001403                             BEQ     .+10
054632  004767  003754                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;QUOTIENT IS WRONG
054636  000273                             273              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)
054640  022701  000000                     CMP     #0,%0+1            ;IS REMAINDER = 0
054644  001403                             BEQ     .+10
054646  004767  003740                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;WRONG REMAINDER
054652  000274                             274              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)
054654  021527  000254                     CMP     (R5),#254
054660  001403                             BEQ     .+10               ;IF IN WRONG SEQUENCE GO TO THE HLT
054662  004767  003724                     JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;TEST IS IN WRONG SEQUENCE
054666  000275                             275              ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                            ;BY  (013746  000172  000207)
054670  005215                             INC     (R5)
                                   ;*********************************************************************
                                   ;TEST:255     DIV     -1 -9. / #3 = -3       REM = 0       PS = 10
                                   ;*********************************************************************
054672  010767  123274             TST255: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
054676  012702  177777                     MOV     #-1,%2             ;LOAD HIGH ORDER WITH -1
054702  012703  177767                     MOV     #-9.,%2+1          ;LOAD LOW ORDER WITH -9.
054706  071227  000003                     DIV     #3,%2              ;DIVIDE BY #3
```

```
054712 106737 042336                MFPS    @#PSWORD        ;SAVE PS

054716 122737 000010 042336         CMPB    #10,@#PSWORD    ;IS PS = 10
054724 001403                       BEQ     .+10
054726 004767 003660                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
054732 000276                       276             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)


054734 022702 177775                CMP     #-3,%2          ;IS QUOTIENT = -3
054740 001403                       BEQ     .+10
054742 004767 003644                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
054746 000277                       277             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)


054750 022703 000000                CMP     #0,%2+1         ;IS REMAINDER = 0
054754 001403                       BEQ     .+10
054756 004767 003630                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
054762 000300                       300             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)

054764 021527 000255                CMP     (R5),#255
054770 001403                       BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
054772 004767 003614                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
054776 000301                       301             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)

055000 005215                       INC     (R5)


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

055002 010767 123164        TST256: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055006 010501                       MOV     R5,R1           ;SAVE R5
055010 012704 000000                MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
055014 012705 000011                MOV     #9.,%4+1        ;LOAD LOW ORDER WITH 9.
055020 071427 000002                DIV     #2,%4           ;DIVIDE BY #2
055024 106737 042336                MFPS    @#PSWORD        ;SAVE PS

055030 122737 000000 042336         CMPB    #0,@#PSWORD     ;IS PS = 0
055036 001403                       BEQ     .+10
055040 004767 003546                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
055044 000302                       302             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)


055046 022704 000004                CMP     #4,%4           ;IS QUOTIENT = 4
055052 001403                       BEQ     .+10
055054 004767 003532                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

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                                                                  ;QUOTIENT IS WRONG
055060  000303                          303                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                             ;BY  (013746  000172  000207)


055062  022705  000001                  CMP     #1,%4+1             ;IS REMAINDER = 1
055066  001403                          BEQ     .+10
055070  004767  003516                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;WRONG REMAINDER
055074  000304                          304                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                             ;BY  (013746  000172  000207)

055076  010105                          MOV     R1,R5               ;RESTORE R5
055100  021527  000256                  CMP     (R5),#256
055104  001403                          BEQ     .+10                ;IF IN WRONG SEQUENCE GO TO THE HLT
055106  004767  003500                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;TEST IS IN WRONG SEQUENCE
055112  000305                          305                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                             ;BY  (013746  000172  000207)

055114  005215                          INC     (R5)

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

055116  010767  123050          TST257: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
055122  012700  177777                  MOV     #-1,%0              ;LOAD HIGH ORDER WITH -1
055126  012701  177767                  MOV     #-9.,%0+1           ;LOAD LOW ORDER WITH -9.
055132  071027  000002                  DIV     #2,%0               ;DIVIDE BY #2
055136  106737  042336                  MFPS    @#PSWORD            ;SAVE PS

055142  122737  000010  042336          CMPB    #10,@#PSWORD        ;IS PS = 10
055150  001403                          BEQ     .+10
055152  004767  003434                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;PS IS WRONG
055156  000306                          306                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                             ;BY  (013746  000172  000207)


055160  022700  177774                  CMP     #-4,%0              ;IS QUOTIENT = -4
055164  001403                          BEQ     .+10
055166  004767  003420                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;QUOTIENT IS WRONG
055172  000307                          307                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                             ;BY  (013746  000172  000207)


055174  022701  177777                  CMP     #-1,%0+1            ;IS REMAINDER = -1
055200  001403                          BEQ     .+10
055202  004767  003404                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                  ;WRONG REMAINDER
055206  000310                          310                  ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                             ;BY  (013746  000172  000207)

055210  021527  000257                  CMP     (R5),#257
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055214  001403                      BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055216  004767  003370              JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;TEST IS IN WRONG SEQUENCE
055222  000311                      311             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)

055224  005215                      INC     (R5)

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

055226  010767  122740      TST260: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055232  012702  000000              MOV     #0,%2           ;LOAD HIGH ORDER WITH 0
055236  012703  000002              MOV     #2,%2+1         ;LOAD LOW ORDER WITH 2
055242  071227  177775              DIV     #-3,%2          ;DIVIDE BY #-3
055246  106737  042336              MFPS    @#PSWORD        ;SAVE PS

055252  122737  000004  042336      CMPB    #4,@#PSWORD     ;IS PS = 4
055260  001403                      BEQ     .+10
055262  004767  003324              JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;PS IS WRONG
055266  000312                      312             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)


055270  022702  000000              CMP     #0,%2           ;IS QUOTIENT = 0
055274  001403                      BEQ     .+10
055276  004767  003310              JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;QUOTIENT IS WRONG
055302  000313                      313             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)


055304  022703  000002              CMP     #2,%2+1         ;IS REMAINDER = 2
055310  001403                      BEQ     .+10
055312  004767  003274              JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG REMAINDER
055316  000314                      314             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)

055320  021527  000260              CMP     (R5),#260
055324  001403                      BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055326  004767  003260              JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;TEST IS IN WRONG SEQUENCE
055332  000315                      315             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                    ;BY  (013746  000172  000207)

055334  005215                      INC     (R5)

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

055336  010767  122630      TST261: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055342  010501                      MOV     R5,R1           ;SAVE R5
```

```
055344  012704  177777                  MOV     #-1,%4          ;LOAD HIGH ORDER WITH -1
055350  012705  177776                  MOV     #-2,%4+1        ;LOAD LOW ORDER WITH -2
055354  071427  000003                  DIV     #3,%4           ;DIVIDE BY #3
055360  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
055364  122737  000004  042336          CMPB    #4,@#PSWORD     ;IS PS = 4
055372  001403                          BEQ     .+10
055374  004767  003212                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055400  000316                          316             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
055402  022704  000000                  CMP     #0,%4           ;IS QUOTIENT = 0
055406  001403                          BEQ     .+10
055410  004767  003176                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
055414  000317                          317             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
055416  022705  177776                  CMP     #-2,%4+1        ;IS REMAINDER = -2
055422  001403                          BEQ     .+10
055424  004767  003162                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
055430  000320                          320             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
055432  010105                          MOV     R1,R5           ;RESTORE R5
055434  021527  000261                  CMP     (R5),#261
055440  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055442  004767  003144                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
055446  000321                          321             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
055450  005215                          INC     (R5)

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

055452  010767  122514          TST262: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055456  012700  177777                  MOV     #-1,%0          ;LOAD HIGH ORDER WITH -1
055462  012701  177777                  MOV     #-1,%0+1        ;LOAD LOW ORDER WITH -1
055466  071027  000001                  DIV     #1,%0           ;DIVIDE BY #1
055472  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
055476  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS PS = 10
055504  001403                          BEQ     .+10
055506  004767  003100                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
055512  000322                          322             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
055514  022700  177777               CMP     #-1,%0          ;IS QUOTIENT = -1
055520  001403                       BEQ     .+10
055522  004767  003064               JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;QUOTIENT IS WRONG
055526  000323                       323             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)


055530  022701  000000               CMP     #0,%0+1         ;IS REMAINDER = 0
055534  001403                       BEQ     .+10
055536  004767  003050               JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;WRONG REMAINDER
055542  000324                       324             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)

055544  021527  000262               CMP     (R5),#262
055550  001403                       BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055552  004767  003034               JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;TEST IS IN WRONG SEQUENCE
055556  000325                       325             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)

055560  005215                       INC     (R5)

                             ;*******************************************************************
                             ;TEST:263       DIV     0 0 / #1 = 0       REM = 0      PS = 4
                             ;*******************************************************************

055562  010767  122404       TST263: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055566  012700  000000               MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
055572  012701  000000               MOV     #0,%0+1         ;LOAD LOW ORDER WITH 0
055576  071027  000001               DIV     #1,%0           ;DIVIDE BY #1
055602  106737  042336               MFPS    @#PSWORD        ;SAVE PS

055606  122737  000004  042336       CMPB    #4,@#PSWORD     ;IS PS = 4
055614  001403                       BEQ     .+10
055616  004767  002770               JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;PS IS WRONG
055622  000326                       326             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)


055624  022700  000000               CMP     #0,%0           ;IS QUOTIENT = 0
055630  001403                       BEQ     .+10
055632  004767  002754               JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;QUOTIENT IS WRONG
055636  000327                       327             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)


055640  022701  000000               CMP     #0,%0+1         ;IS REMAINDER = 0
055644  001403                       BEQ     .+10
055646  004767  002740               JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                     ;WRONG REMAINDER
055652  000330                       330             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                     ;BY  (013746  000172  000207)
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055654  021527  000263                  CMP     (R5),#263
055660  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055662  004767  002724                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
055666  000331                          331             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055670  005215                          INC     (R5)

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

055672  010767  122274          TST264: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
055676  012702  177777                  MOV     #-1,%2          ;LOAD HIGH ORDER WITH -1
055702  012703  125252                  MOV     #125252,%2+1    ;LOAD LOW ORDER WITH 125252
055706  071227  000002                  DIV     #2,%2           ;DIVIDE BY #2
055712  106737  042336                  MFPS    @#PSWORD        ;SAVE PS

055716  122737  000010  042336          CMPB    #10,@#PSWORD    ;IS PS = 10
055724  001403                          BEQ     .+10
055726  004767  002660                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
055732  000332                          332             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055734  022702  152525                  CMP     #152525,%2      ;IS QUOTIENT = 152525
055740  001403                          BEQ     .+10
055742  004767  002644                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
055746  000333                          333             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


055750  022703  000000                  CMP     #0,%2+1         ;IS REMAINDER = 0
055754  001403                          BEQ     .+10
055756  004767  002630                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
055762  000334                          334             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

055764  021527  000264                  CMP     (R5),#264
055770  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
055772  004767  002614                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
055776  000335                          335             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056000  005215                          INC     (R5)

                                ;*******************************************************************
                                ;TEST:265       DIV     -1 -1 / #-1 = 1      REM = 0     PS = 0
                                ;*******************************************************************
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056002  010767  122164          TST265: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056006  010501                          MOV     R5,R1                   ;SAVE R5
056010  012704  177777                  MOV     #-1,%4                  ;LOAD HIGH ORDER WITH -1
056014  012705  177777                  MOV     #-1,%4+1                ;LOAD LOW ORDER WITH -1
056020  071427  177777                  DIV     #-1,%4                  ;DIVIDE BY #-1
056024  106737  042336                  MFPS    @#PSWORD                ;SAVE PS

056030  122737  000000  042336          CMPB    #0,@#PSWORD             ;IS PS = 0
056036  001403                          BEQ     .+10
056040  004767  002546                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
056044  000336                          336             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056046  022704  000001                  CMP     #1,%4                   ;IS QUOTIENT = 1
056052  001403                          BEQ     .+10
056054  004767  002532                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
056060  000337                          337             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


056062  022705  000000                  CMP     #0,%4+1                 ;IS REMAINDER = 0
056066  001403                          BEQ     .+10
056070  004767  002516                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
056074  000340                          340             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056076  010105                          MOV     R1,R5                   ;RESTORE R5
056100  021527  000265                  CMP     (R5),#265
056104  001403                          BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
056106  004767  002500                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
056112  000341                          341             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

056114  005215                          INC     (R5)


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

056116  010767  122050          TST266: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056122  012700  025253                  MOV     #25253,%0               ;LOAD HIGH ORDER WITH 25253
056126  012701  000001                  MOV     #1,%0+1                 ;LOAD LOW ORDER WITH 1
056132  071027  125252                  DIV     #125252,%0              ;DIVIDE BY #125252
056136  106737  042336                  MFPS    @#PSWORD                ;SAVE PS

056142  122737  000010  042336          CMPB    #10,@#PSWORD            ;IS PS = 10
056150  001403                          BEQ     .+10
056152  004767  002434                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
056156  000342                          342             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

```
056160  022700  100000                    CMP     #100000,%0         ;IS QUOTIENT = 100000
056164  001403                            BEQ     .+10
056166  004767  002420                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;QUOTIENT IS WRONG
056172  000343                            343             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)


056174  022701  000001                    CMP     #1,%0+1            ;IS REMAINDER = 1
056200  001403                            BEQ     .+10
056202  004767  002404                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;WRONG REMAINDER
056206  000344                            344             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

056210  021527  000266                    CMP     (R5),#266
056214  001403                            BEQ     .+10               ;IF IN WRONG SEQUENCE GO TO THE HLT
056216  004767  002370                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;TEST IS IN WRONG SEQUENCE
056222  000345                            345             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)

056224  005215                            INC     (R5)

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

056226  010767  121740            TST267: MOV     PC,LPADR           ;STORE ERROR LOOP ADDRESS
056232  012702  037777                    MOV     #37777,%2          ;LOAD HIGH ORDER WITH 37777
056236  012703  077777                    MOV     #77777,%2+1        ;LOAD LOW ORDER WITH 77777
056242  071227  077777                    DIV     #77777,%2          ;DIVIDE BY #77777
056246  106737  042336                    MFPS    @#PSWORD           ;SAVE PS

056252  122737  000000  042336            CMPB    #0,@#PSWORD        ;IS PS = 0
056260  001403                            BEQ     .+10
056262  004767  002324                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;PS IS WRONG
056266  000346                            346             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)


056270  022702  077777                    CMP     #77777,%2          ;IS QUOTIENT = 77777
056274  001403                            BEQ     .+10
056276  004767  002310                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;QUOTIENT IS WRONG
056302  000347                            347             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                          ;BY  (013746  000172  000207)


056304  022703  077776                    CMP     #77776,%2+1        ;IS REMAINDER = 77776
056310  001403                            BEQ     .+10
056312  004767  002274                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                           ;WRONG REMAINDER
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056316  000350                          350            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

056320  021527  000267                  CMP     (R5),#267
056324  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056326  004767  002260                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056332  000351                          351            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

056334  005215                          INC     (R5)

                                ;*************************************************************************
                                ;TEST:270       DIV      0 100000 / #2 = 40000       REM = 0       PS = 0
                                ;*************************************************************************

056336  010767  121630          TST270: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056342  010501                          MOV     R5,R1           ;SAVE R5
056344  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
056350  012705  100000                  MOV     #100000,%4+1    ;LOAD LOW ORDER WITH 100000
056354  071427  000002                  DIV     #2,%4           ;DIVIDE BY #2
056360  106737  042336                  MFPS    @#PSWORD        ;SAVE PS

056364  122737  000000  042336          CMPB    #0,@#PSWORD     ;IS PS = 0
056372  001403                          BEQ     .+10
056374  004767  002212                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
056400  000352                          352            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)


056402  022704  040000                  CMP     #40000,%4       ;IS QUOTIENT = 40000
056406  001403                          BEQ     .+10
056410  004767  002176                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
056414  000353                          353            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)


056416  022705  000000                  CMP     #0,%4+1         ;IS REMAINDER = 0
056422  001403                          BEQ     .+10
056424  004767  002162                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
056430  000354                          354            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

056432  010105                          MOV     R1,R5           ;RESTORE R5
056434  021527  000270                  CMP     (R5),#270
056440  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056442  004767  002144                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
056446  000355                          355            ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                       ;BY  (013746  000172  000207)

056450  005215                          INC     (R5)
```

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

056452  010767  121514                     TST271: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
056456  012700  177777                             MOV     #177777,%0          ;LOAD HIGH ORDER WITH 177777
056462  012701  077777                             MOV     #77777,%0+1         ;LOAD LOW ORDER WITH 77777
056466  071027  177776                             DIV     #177776,%0          ;DIVIDE BY #177776
056472  106737  042336                             MFPS    @#PSWORD            ;SAVE PS

056476  122737  000000  042336                     CMPB    #0,@#PSWORD         ;IS PS = 0
056504  001403                                     BEQ     .+10
056506  004767  002100                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;PS IS WRONG
056512  000356                                     356                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                       ;BY  (013746  000172  000207)


056514  022700  040000                             CMP     #40000,%0           ;IS QUOTIENT = 40000
056520  001403                                     BEQ     .+10
056522  004767  002064                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;QUOTIENT IS WRONG
056526  000357                                     357                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                       ;BY  (013746  000172  000207)


056530  022701  177777                             CMP     #177777,%0+1        ;IS REMAINDER = 177777
056534  001403                                     BEQ     .+10
056536  004767  002050                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;WRONG REMAINDER
056542  000360                                     360                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                       ;BY  (013746  000172  000207)

056544  021527  000271                             CMP     (R5),#271
056550  001403                                     BEQ     .+10                ;IF IN WRONG SEQUENCE GO TO THE HLT
056552  004767  002034                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;TEST IS IN WRONG SEQUENCE
056556  000361                                     361                 ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                                       ;BY  (013746  000172  000207)

056560  005215                                     INC     (R5)

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

056562  010767  121404                     TST272: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
056566  012702  000000                             MOV     #0,%2               ;LOAD HIGH ORDER WITH 0
056572  012703  052525                             MOV     #52525,%2+1         ;LOAD LOW ORDER WITH 52525
056576  071227  052525                             DIV     #52525,%2           ;DIVIDE BY #52525
056602  106737  042336                             MFPS    @#PSWORD            ;SAVE PS

056606  122737  000000  042336                     CMPB    #0,@#PSWORD         ;IS PS = 0
056614  001403                                     BEQ     .+10
056616  004767  001770                             JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                               ;PS IS WRONG
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056622  000362                          362             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
056624  022702  000001                  CMP     #1,%2           ;IS QUOTIENT = 1
056630  001403                          BEQ     .+10
056632  004767  001754                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
056636  000363                          363             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
056640  022703  000000                  CMP     #0,%2+1         ;IS REMAINDER = 0
056644  001403                          BEQ     .+10
056646  004767  001740                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
056652  000364                          364             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
056654  021527  000272                  CMP     (R5),#272
056660  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056662  004767  001724                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
056666  000365                          365             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
056670  005215                          INC     (R5)
                                ;*************************************************************************
                                ;TEST:273       DIV     0 77777 / #0 = DUMMY        REM = DUMMY       PS = 3
                                ;*************************************************************************
056672  010767  121274          TST273: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
056676  010501                          MOV     R5,R1           ;SAVE R5
056700  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
056704  012705  077777                  MOV     #77777,%4+1     ;LOAD LOW ORDER WITH 77777
056710  071427  000000                  DIV     #0,%4           ;DIVIDE BY #0
056714  106737  042336                  MFPS    @#PSWORD        ;SAVE PS
056720  042737  000014  042336          BIC     #14,@#PSWORD
056726  122737  000003  042336          CMPB    #3,@#PSWORD     ;IS PS = 3
056734  001403                          BEQ     .+10
056736  004767  001650                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
056742  000366                          366             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
056744  010105                          MOV     R1,R5           ;RESTORE R5
056746  021527  000273                  CMP     (R5),#273
056752  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
056754  004767  001632                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
056760  000367                          367             ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)
```

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056762 005215                           INC     (R5)


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

056764 010767 121202            TST274: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
056770 012700 077777                    MOV     #77777,%0               ;LOAD HIGH ORDER WITH 77777
056774 012701 177777                    MOV     #177777,%0+1            ;LOAD LOW ORDER WITH 177777
057000 071027 000002                    DIV     #2,%0                   ;DIVIDE BY #2
057004 106737 042336                    MFPS    @#PSWORD                ;SAVE PS
057010 042737 000014 042336             BIC     #14,@#PSWORD

057016 122737 000002 042336             CMPB    #2,@#PSWORD             ;IS PS = 2
057024 001403                           BEQ     .+10
057026 004767 001560                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
057032 000370                           370             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057034 021527 000274                    CMP     (R5),#274
057040 001403                           BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
057042 004767 001544                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
057046 000371                           371             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057050 005215                           INC     (R5)

057052 012702 000002                    MOV     #2,%2
057056 012703 042400                    MOV     #S9,%3
057062 012704 042402                    MOV     #S10,%4

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

057066 010767 121100            TST275: MOV     PC,LPADR                ;STORE ERROR LOOP ADDRESS
057072 012700 000000                    MOV     #0,%0                   ;LOAD HIGH ORDER WITH 0
057076 012701 052525                    MOV     #52525,%0+1             ;LOAD LOW ORDER WITH 52525
057102 071067 163272                    DIV     S9,%0                   ;DIVIDE BY S9
057106 106737 042336                    MFPS    @#PSWORD                ;SAVE PS

057112 122737 000000 042336             CMPB    #0,@#PSWORD             ;IS PS = 0
057120 001403                           BEQ     .+10
057122 004767 001464                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;PS IS WRONG
057126 000372                           372             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057130 022700 025252                    CMP     #25252,%0               ;IS QUOTIENT = 25252
057134 001403                           BEQ     .+10
057136 004767 001450                    JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
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057142  000373                  373                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057144  022701  000001          CMP     #1,%0+1         ;IS REMAINDER = 1
057150  001403                  BEQ     .+10
057152  004767  001434          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
057156  000374                  374                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057160  021527  000275          CMP     (R5),#275
057164  001403                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057166  004767  001420          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE
057172  000375                  375                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057174  005215                  INC     (R5)

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

057176  010767  120770  TST276: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057202  012700  000000          MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057206  012701  052525          MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057212  071077  163164          DIV     @S10,%0         ;DIVIDE BY @S10
057216  106737  042336          MFPS    @#PSWORD        ;SAVE PS

057222  122737  000000  042336  CMPB    #0,@#PSWORD     ;IS PS = 0
057230  001403                  BEQ     .+10
057232  004767  001354          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;PS IS WRONG
057236  000376                  376                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057240  022700  025252          CMP     #25252,%0       ;IS QUOTIENT = 25252
057244  001403                  BEQ     .+10
057246  004767  001340          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
057252  000377                  377                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)


057254  022701  000001          CMP     #1,%0+1         ;IS REMAINDER = 1
057260  001403                  BEQ     .+10
057262  004767  001324          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                        ;WRONG REMAINDER
057266  000400                  400                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057270  021527  000276          CMP     (R5),#276
057274  001403                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057276  004767  001310          JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
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                                                       ;TEST IS IN WRONG SEQUENCE
057302  000401                           401         ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                     ;BY  (013746  000172  000207)

057304  005215                           INC     (R5)

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

057306  010767  120660         TST277: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
057312  012700  000000                 MOV     #0,%0               ;LOAD HIGH ORDER WITH 0
057316  012701  052525                 MOV     #52525,%0+1         ;LOAD LOW ORDER WITH 52525
057322  071037  042400                 DIV     @#S9,%0             ;DIVIDE BY @#S9
057326  106737  042336                 MFPS    @#PSWORD            ;SAVE PS

057332  122737  000000  042336         CMPB    #0,@#PSWORD         ;IS PS = 0
057340  001403                         BEQ     .+10
057342  004767  001244                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                       ;PS IS WRONG
057346  000402                         402           ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                     ;BY  (013746  000172  000207)

057350  022700  025252                 CMP     #25252,%0           ;IS QUOTIENT = 25252
057354  001403                         BEQ     .+10
057356  004767  001230                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                       ;QUOTIENT IS WRONG
057362  000403                         403           ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                     ;BY  (013746  000172  000207)

057364  022701  000001                 CMP     #1,%0+1             ;IS REMAINDER = 1
057370  001403                         BEQ     .+10
057372  004767  001214                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                       ;WRONG REMAINDER
057376  000404                         404           ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                     ;BY  (013746  000172  000207)

057400  021527  000277                 CMP     (R5),#277
057404  001403                         BEQ     .+10                ;IF IN WRONG SEQUENCE GO TO THE HLT
057406  004767  001200                 JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                       ;TEST IS IN WRONG SEQUENCE
057412  000405                         405           ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                     ;BY  (013746  000172  000207)

057414  005215                         INC     (R5)

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

057416  010767  120550         TST300: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
057422  012700  000000                 MOV     #0,%0               ;LOAD HIGH ORDER WITH 0
057426  012701  052525                 MOV     #52525,%0+1         ;LOAD LOW ORDER WITH 52525
057432  071002                         DIV     %2,%0               ;DIVIDE BY %2
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057434  106737  042336                  MFPS    @#PSWORD        ;SAVE PS

057440  122737  000000  042336          CMPB    #0,@#PSWORD     ;IS PS = 0
057446  001403                          BEQ     .+10
057450  004767  001136                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057454  000406                          406             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)



057456  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
057462  001403                          BEQ     .+10
057464  004767  001122                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
057470  000407                          407             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)



057472  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
057476  001403                          BEQ     .+10
057500  004767  001106                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;WRONG REMAINDER
057504  000410                          410             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057506  021527  000300                  CMP     (R5),#300
057512  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057514  004767  001072                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
057520  000411                          411             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

057522  005215                          INC     (R5)


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

057524  010767  120442          TST301: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057530  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057534  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057540  071023                          DIV     (3)+,%0         ;DIVIDE BY (3)+
057542  106737  042336                  MFPS    @#PSWORD        ;SAVE PS

057546  122737  000000  042336          CMPB    #0,@#PSWORD     ;IS PS = 0
057554  001403                          BEQ     .+10
057556  004767  001030                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;PS IS WRONG
057562  000412                          412             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)



057564  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
057570  001403                          BEQ     .+10
057572  004767  001014                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
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057576  000413                        413                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                              ;BY  (013746  000172  000207)


057600  022701  000001                CMP     #1,%0+1         ;IS REMAINDER = 1
057604  001403                        BEQ     .+10
057606  004767  001000                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;WRONG REMAINDER
057612  000414                        414                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                              ;BY  (013746  000172  000207)

057614  021527  000301                CMP     (R5),#301
057620  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057622  004767  000764                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;TEST IS IN WRONG SEQUENCE
057626  000415                        415                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                              ;BY  (013746  000172  000207)

057630  005215                        INC     (R5)

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

057632  010767  120334        TST302: MOV     PC,LPADR        ;STORE ERROR LOOP ADDRESS
057636  012700  000000                MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
057642  012701  052525                MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
057646  071043                        DIV     -(3),%0         ;DIVIDE BY -(3)
057650  106737  042336                MFPS    @#PSWORD        ;SAVE PS

057654  122737  000000  042336        CMPB    #0,@#PSWORD     ;IS PS = 0
057662  001403                        BEQ     .+10
057664  004767  000722                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;PS IS WRONG
057670  000416                        416                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                              ;BY  (013746  000172  000207)


057672  022700  025252                CMP     #25252,%0       ;IS QUOTIENT = 25252
057676  001403                        BEQ     .+10
057700  004767  000706                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;QUOTIENT IS WRONG
057704  000417                        417                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                              ;BY  (013746  000172  000207)


057706  022701  000001                CMP     #1,%0+1         ;IS REMAINDER = 1
057712  001403                        BEQ     .+10
057714  004767  000672                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                              ;WRONG REMAINDER
057720  000420                        420                     ;TO SCOPE, REPLACE LAST:  BEQ   .+10 (001403)
                                                              ;BY  (013746  000172  000207)

057722  021527  000302                CMP     (R5),#302
057726  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
057730  004767  000656                JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
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                                                            ;TEST IS IN WRONG SEQUENCE
057734  000421                          421                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

057736  005215                          INC     (R5)

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

057740  010767  120226          TST303: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
057744  012700  000000                  MOV     #0,%0               ;LOAD HIGH ORDER WITH 0
057750  012701  052525                  MOV     #52525,%0+1         ;LOAD LOW ORDER WITH 52525
057754  071064  000002                  DIV     2(4),%0             ;DIVIDE BY 2(4)
057760  106737  042336                  MFPS    @#PSWORD            ;SAVE PS

057764  122737  000000  042336          CMPB    #0,@#PSWORD         ;IS PS = 0
057772  001403                          BEQ     .+10
057774  004767  000612                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;PS IS WRONG
060000  000422                          422                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)


060002  022700  025252                  CMP     #25252,%0           ;IS QUOTIENT = 25252
060006  001403                          BEQ     .+10
060010  004767  000576                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;QUOTIENT IS WRONG
060014  000423                          423                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)


060016  022701  000001                  CMP     #1,%0+1             ;IS REMAINDER = 1
060022  001403                          BEQ     .+10
060024  004767  000562                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;WRONG REMAINDER
060030  000424                          424                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

060032  021527  000303                  CMP     (R5),#303
060036  001403                          BEQ     .+10                ;IF IN WRONG SEQUENCE GO TO THE HLT
060040  004767  000546                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                            ;TEST IS IN WRONG SEQUENCE
060044  000425                          425                 ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                            ;BY  (013746  000172  000207)

060046  005215                          INC     (R5)

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

060050  010767  120116          TST304: MOV     PC,LPADR            ;STORE ERROR LOOP ADDRESS
060054  012700  000000                  MOV     #0,%0               ;LOAD HIGH ORDER WITH 0
060060  012701  052525                  MOV     #52525,%0+1         ;LOAD LOW ORDER WITH 52525
060064  071074  000000                  DIV     @(4),%0             ;DIVIDE BY @(4)
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060070  106737  042336                  MFPS    @#PSWORD          ;SAVE PS

060074  122737  000000  042336          CMPB    #0,@#PSWORD       ;IS PS = 0
060102  001403                          BEQ     .+10
060104  004767  000502                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;PS IS WRONG
060110  000426                          426             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)



060112  022700  025252                  CMP     #25252,%0         ;IS QUOTIENT = 25252
060116  001403                          BEQ     .+10
060120  004767  000466                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;QUOTIENT IS WRONG
060124  000427                          427             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)



060126  022701  000001                  CMP     #1,%0+1           ;IS REMAINDER = 1
060132  001403                          BEQ     .+10
060134  004767  000452                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;WRONG REMAINDER
060140  000430                          430             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060142  021527  000304                  CMP     (R5),#304
060146  001403                          BEQ     .+10              ;IF IN WRONG SEQUENCE GO TO THE HLT
060150  004767  000436                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;TEST IS IN WRONG SEQUENCE
060154  000431                          431             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)

060156  005215                          INC     (R5)


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

060160  010767  120006          TST305: MOV     PC,LPADR          ;STORE ERROR LOOP ADDRESS
060164  012700  000000                  MOV     #0,%0             ;LOAD HIGH ORDER WITH 0
060170  012701  052525                  MOV     #52525,%0+1       ;LOAD LOW ORDER WITH 52525
060174  071034                          DIV     @(4)+,%0          ;DIVIDE BY @(4)+
060176  106737  042336                  MFPS    @#PSWORD          ;SAVE PS

060202  122737  000000  042336          CMPB    #0,@#PSWORD       ;IS PS = 0
060210  001403                          BEQ     .+10
060212  004767  000374                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;PS IS WRONG
060216  000432                          432             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                        ;BY  (013746  000172  000207)



060220  022700  025252                  CMP     #25252,%0         ;IS QUOTIENT = 25252
060224  001403                          BEQ     .+10
060226  004767  000360                  JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;QUOTIENT IS WRONG
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060232  000433                           433              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)


060234  022701  000001                   CMP     #1,%0+1          ;IS REMAINDER = 1
060240  001403                           BEQ     .+10
060242  004767  000344                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;WRONG REMAINDER
060246  000434                           434              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)

060250  021527  000305                   CMP     (R5),#305
060254  001403                           BEQ     .+10             ;IF IN WRONG SEQUENCE GO TO THE HLT
060256  004767  000330                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;TEST IS IN WRONG SEQUENCE
060262  000435                           435              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)

060264  005215                           INC     (R5)


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

060266  010767  117700           TST306: MOV     PC,LPADR         ;STORE ERROR LOOP ADDRESS
060272  012700  000000                   MOV     #0,%0            ;LOAD HIGH ORDER WITH 0
060276  012701  052525                   MOV     #52525,%0+1      ;LOAD LOW ORDER WITH 52525
060302  071054                           DIV     @-(4),%0         ;DIVIDE BY @-(4)
060304  106737  042336                   MFPS    @#PSWORD         ;SAVE PS

060310  122737  000000  042336           CMPB    #0,@#PSWORD      ;IS PS = 0
060316  001403                           BEQ     .+10
060320  004767  000266                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;PS IS WRONG
060324  000436                           436              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)


060326  022700  025252                   CMP     #25252,%0        ;IS QUOTIENT = 25252
060332  001403                           BEQ     .+10
060334  004767  000252                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;QUOTIENT IS WRONG
060340  000437                           437              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)


060342  022701  000001                   CMP     #1,%0+1          ;IS REMAINDER = 1
060346  001403                           BEQ     .+10
060350  004767  000236                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
                                                          ;WRONG REMAINDER
060354  000440                           440              ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
                                                          ;BY  (013746  000172  000207)

060356  021527  000306                   CMP     (R5),#306
060362  001403                           BEQ     .+10             ;IF IN WRONG SEQUENCE GO TO THE HLT
060364  004767  000222                   JSR     PC,$HLT;SEEN AN ERROR, GO TO THE HALT ROUTINE
```

```
15342                                                   ;TEST IS IN WRONG SEQUENCE
15343 060370 000441                 441             ;TO SCOPE, REPLACE LAST:  BEQ  .+10 (001403)
15344                                                   ;BY  (013746  000172  000207)
15345
15346 060372 005215                 INC     (R5)
15347
```

```
                                        .SBTTL  END OF PASS ROUTINE
                                        ;*******************************************************************************
                                        ;*INCREMENT THE PASS NUMBER ($PASS) IN APT MAILBOX
                                        ;*TYPE ''END PASS #XXXXX'' (WHERE XXXXX IS A DECIMAL NUMBER)
                                        ;*IF THERE IS A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO RESTART
                                        ;*******************************************************************************

060374  005227  177777                  $EOP:    INC     #-1                  ;TYPE ID ONLY ON FIRST PASS
060400  001002                                   BNE     SKPMSG               ;BRANCH AROUND AFTER FIRST PASS
060402  104401  060550                           TYPE    ,MSG1                ;TYPE TITLE
060406  005267  117674                  SKPMSG:  INC     $PASS                ;INCREMENT THE PASS NUMBER
060412  042767  100000  117666                   BIC     #100000,$PASS        ;DON'T LET COUNT GO NEGATIVE
060420  005327                                   DEC     (PC)+                ;LOOP?
060422  000001                          $EOPCT:  .WORD   1
060424  003037                                   BGT     $DOAGN               ;YES
060426  012737                                   MOV     (PC)+,@(PC)+         ;RESTORE LOOP COUNTER
060430  000016                          $ENDCT:  .WORD   16
060432  060422                                   $EOPCT
060434  104401  060533                           TYPE    ,$ENDMG              ;TYPE ''END PASS #''
060440  016746  117642                           MOV     $PASS,-(SP)          ;SAVE PASS COUNT FOR TYPEOUT
060444  104405                                   TYPDS                        ;GO TYPE PASS COUNT IN DECIMAL
060446  104401  060530                           TYPE    ,$ENULL              ;TYPE A FEW NULL CHARACTERS
060452  013700  000042                  $GET42:  MOV     @#42,R0              ;GET MONITOR ADDRESS
060456  001405                                   BEQ     DOAGIN               ;BRANCH IF NO MONITOR
060460  000005                                   RESET                        ;CLEAR THE WORLD
060462  004710                          $ENDAD:  JSR     PC,(R0)              ;GO TO MONITOR
060464  000240                                   NOP                          ;SAVE ROOM
060466  000240                                   NOP                          ;FOR
060470  000240                                   NOP                          ;ACT11
060472  013746  000004                  DOAGIN:  MOV     @#4,-(SP)            ;SAVE CONTENTS OF LOCATION 4
060476  012737  060514  000004                   MOV     #1$,@#4              ;SET UP IN CASE OF TRAP
060504  012737  000001  164000                   MOV     #1,@#164000          ;NOTIFY MULTI-TESTER WE'RE DONE
060512  000402                                   BR      2$                   ;NO TRAP SO DON'T RESET STACK
060514  062706  000004                  1$:      ADD     #4,SP                ;RESET STACK AFTER TRAP
060520  012637  000004                  2$:      MOV     (SP)+,@#4            ;RESTORE LOCATION 4 FOR TESTING
060524  000137                          $DOAGN:  JMP     @(PC)+               ;RETURN TO TEST
060526  001024                          $RTNAD:  .WORD   RESTRT
060530     377     377     000          $ENULL:  .BYTE   -1,-1,0              ;NULL CHARACTER STRING
060533     015  042412  042116          $ENDMG:  .ASCIZ  <15><12>/END PASS #/
060540  050040  051501  020123
060546  000043
060550  005015  045103  042113          MSG1:    .ASCIZ  <15><12>/CJKDBC0 DCF11-AA CPU DIAGNOSTIC/
060556  041502  020060  041504
060564  030506  026461  040501
060572  041440  052520  042040
060600  040511  047107  051517
060606  044524  000103
                                        .EVEN
```

```
                                          .SBTTL  HALT ROUTINE

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

060612  017637  000000  000302  $HLT:     MOV     @(SP),@#$FATAL    ;PLACE THE ERROR NUMBER AT LOCATION $FATAL
060620  011637  061000                    MOV     (SP),@#CONTIN     ;SAVE ERROR NUMBER ADDRESS
060624  032777  020000  146622            BIT     #20000,@SWR       ;HAS THE OPERATOR ASKED TO SUPRESS ERROR TYPE OUTS
060632  001021                            BNE     6$
060634  104401  042414                    TYPE    ,$CRLF            ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060640  104401  060740                    TYPE    ,MSGERR           ;INFORM ERROR
060644  104401  042414                    TYPE    ,$CRLF            ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060650  013746  061000                    MOV     @#CONTIN,-(SP)    ;RETREIVE ERROR NUMBER ADDR
060654  162716  000004                    SUB     #4,(SP)           ;CALCULATE ERROR PC
060660  104402                            TYPOC                     ;TYPE PC
060662  104401  042414                    TYPE    ,$CRLF            ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060666  013746  000302                    MOV     @#$FATAL,-(SP)    ;RETREIVE ERROR NUMBER
060672  104403                            TYPOS                     ;TYPE ERROR NUMBER
060674     003                            .BYTE   3
060675     000                            .BYTE   0
060676  105767  117416          6$:       TSTB    $ENV              ;IF WE ARE NOT UNDER APT. THEN GO TO
060702  001403                            BEQ     8$                ;8$
060704  005237  000300                    INC     @#$MSGTY          ;OTHERWISE INFORM APT. ABOUT SEEING THE ERROR
060710  000777                            BR      .                 ;AND LOOP
060712  104401  042414          8$:       TYPE    ,$CRLF            ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
060716  005777  146532                    TST     @SWR     ;IS IT REQUIRED TO HALT ON ERROR ?
060722  100001                            BPL     10$               ;IF NOT THEN GO TO 10$
060724  000000                            HALT
060726  013746  061000          10$:      MOV     @#CONTIN,-(SP)    ;
060732  062716  000002                    ADD     #2,(SP)           ;CALCULATE RETURN ADDRESS
060736  000207                            RTS     PC                ;RETURN
060740  042440  051122  051117  MSGERR: .ASCIZ / ERROR!   PC, AND ERROR # ARE: /
060746  020041  020040  041520
060754  020054  047101  020104
060762  051105  047522  020122
060770  020043  051101  035105
060776  000040
                                .EVEN
061000  000000                  CONTIN: .WORD 0

                                .SBTTL  POWER FAIL ROUTINE
061002  012767  061012  117014  PWRDN:    MOV     #PWRUP,24
061010  000000                            HALT

061012  012767  061002  117004  PWRUP:    MOV     #PWRDN,24
061020  012706  001000                    MOV     #BUFF,SP
061024  132767  000040  117267            BITB    #40,$ENVM         ;WILL APT ALLOW PRINTING?
061032  001013                            BNE     PFRES             ;NO
061034  012700  061066                    MOV     #MSGPWF,R0        ;GET MSG ADDR.
061040  105737  177564          PWAIT:    TSTB    @#TPS             ;TTY READY
061044  100375                            BPL     PWAIT             ;NO WAIT
061046  112037  177566                    MOVB    (R0)+,@#TPB       ;PRINT CHARACTER
```

```
061052  001372                           BNE     PWAIT                   ;NEXT IF NOT DONE.
061054  105737  177564          PWAIT1:  TSTB    @#TPS
061060  100375                           BPL     PWAIT1
061062  000167  117736          PFRES:   JMP     RESTRT
061066  005015  047520  042527  MSGPWF:  .ASCIZ  <15><12>.POWER FAILED!.
061074  020122  040506  046111
061102  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
                                ;*

061106  105767  000261          $TYPE:   TSTB    $TPFLG                  ;;IS THERE A TERMINAL?
061112  100002                           BPL     1$                      ;;BR IF YES
061114  000000                           HALT                            ;;HALT HERE IF NO TERMINAL
061116  000430                           BR      3$                      ;;LEAVE
061120  010046                  1$:      MOV     R0,-(SP)                ;;SAVE R0
061122  017600  000002                   MOV     @2(SP),R0               ;;GET ADDRESS OF ASCIZ STRING
061126  122767  000001  117164           CMPB    #APTENV,$ENV            ;;RUNNING IN APT MODE
061134  001011                           BNE     62$                     ;;NO,GO CHECK FOR APT CONSOLE
061136  132767  000100  117155           BITB    #APTSPOOL,$ENVM         ;;SPOOL MESSAGE TO APT
061144  001405                           BEQ     62$                     ;;NO,GO CHECK FOR CONSOLE
061146  010067  000004                   MOV     R0,61$                  ;;SETUP MESSAGE ADDRESS FOR APT
061152  004767  000230                   JSR     PC,$ATY3                ;;SPOOL MESSAGE TO APT
061156  000000                  61$:     .WORD   0                       ;;MESSAGE ADDRESS
061160  132767  000040  117133  62$:     BITB    #APTCSUP,$ENVM          ;;APT CONSOLE SUPPRESSED
061166  001003                           BNE     60$                     ;;YES,SKIP TYPE OUT
061170  112046                  2$:      MOVB    (R0)+,-(SP)             ;;PUSH CHARACTER TO BE TYPED ONTO STACK
061172  001005                           BNE     4$                      ;;BR IF IT ISN'T THE TERMINATOR
061174  005726                           TST     (SP)+                   ;;IF TERMINATOR POP IT OFF THE STACK
061176  012600                  60$:     MOV     (SP)+,R0                ;;RESTORE R0
061200  062716  000002          3$:      ADD     #2,(SP)                 ;;ADJUST RETURN PC
061204  000002                           RTI                             ;;RETURN
061206  122716  000011          4$:      CMPB    #HT,(SP)                ;;BRANCH IF <HT>
061212  001430                           BEQ     8$
061214  122716  000200                   CMPB    #CRLF,(SP)              ;;BRANCH IF NOT <CRLF>
061220  001006                           BNE     5$
061222  005726                           TST     (SP)+                   ;;POP  <CR><LF> EQUIV
061224  104401                           TYPE                            ;;TYPE A CR AND LF
061226  042414                           $CRLF
061230  105067  000130                   CLRB    $CHARCNT                ;;CLEAR CHARACTER COUNT
061234  000755                           BR      2$                      ;;GET NEXT CHARACTER
061236  004767  000056          5$:      JSR     PC,$TYPEC               ;;GO TYPE THIS CHARACTER
```

```
061242  126726  000124           6$:     CMPB    $FILLC,(SP)+       ;;IS IT TIME FOR FILLER CHARS.?
061246  001350                           BNE     2$                 ;;IF NO GO GET NEXT CHAR.
061250  016746  000114                   MOV     $NULL,-(SP)        ;;GET # OF FILLER CHARS. NEEDED
                                                                    ;;AND THE NULL CHAR.
061254  105366  000001           7$:     DECB    1(SP)              ;;DOES A NULL NEED TO BE TYPED?
061260  002770                           BLT     6$                 ;;BR IF NO--GO POP THE NULL OFF OF STACK
061262  004767  000032                   JSR     PC,$TYPEC          ;;GO TYPE A NULL
061266  105367  000072                   DECB    $CHARCNT           ;;DO NOT COUNT AS A COUNT
061272  000770                           BR      7$                 ;;LOOP

                                 ;HORIZONTAL TAB PROCESSOR

061274  112716  000040           8$:     MOVB    #' ,(SP)           ;;REPLACE TAB WITH SPACE
061300  004767  000014           9$:     JSR     PC,$TYPEC          ;;TYPE A SPACE
061304  132767  000007  000052           BITB    #7,$CHARCNT        ;;BRANCH IF NOT AT
061312  001372                           BNE     9$                 ;;TAB STOP
061314  005726                           TST     (SP)+              ;;POP SPACE OFF STACK
061316  000724                           BR      2$                 ;;GET NEXT CHARACTER
061320  105777  161066           $TYPEC: TSTB    @$TPS              ;;WAIT UNTIL PRINTER IS READY
061324  100375                           BPL     $TYPEC
061326  116677  000002  161054           MOVB    2(SP),@$TPB        ;;LOAD CHAR TO BE TYPED INTO DATA REG.
061334  122766  000015  000002           CMPB    #CR,2(SP)          ;;IS CHARACTER A CARRIAGE RETURN?
061342  001003                           BNE     1$                 ;;BRANCH IF NO
061344  105067  000014                   CLRB    $CHARCNT           ;;YES--CLEAR CHARACTER COUNT
061350  000406                           BR      $TYPEX             ;;EXIT
061352  122766  000012  000002   1$:     CMPB    #LF,2(SP)          ;;IS CHARACTER A LINE FEED?
061360  001402                           BEQ     $TYPEX             ;;BRANCH IF YES
061362  105227                           INCB    (PC)+              ;;COUNT THE CHARACTER
061364  000000                   $CHARCNT:.WORD  0                  ;;CHARACTER COUNT STORAGE
061366  000207                   $TYPEX: RTS     PC

061370     000                   $NULL:  .BYTE   0                  ;;CONTAINS NULL CHARACTER FOR FILLS
061371     002                   $FILLS: .BYTE   2                  ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
061372     012                   $FILLC: .BYTE   12                 ;;INSERT FILL CHARS. AFTER A "LINE FEED"
061373     000                   $TPFLG: .BYTE   0                  ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
061374     077                   $QUES:  .ASCII  "?"                ;;QUESTION MARK
061375     012     000           $LF:    .ASCIZ  <12>               ;;LINEFEED
        061400                           .EVEN
                                 .SBTTL  APT COMMUNICATIONS ROUTINE

                                 ;*******************************************************************************
061400  112767  000001  000236   $ATY1:  MOVB    #1,$FFLG           ;;TO REPORT FATAL ERROR
061406  112767  000001  000226   $ATY3:  MOVB    #1,$MFLG           ;;TO TYPE A MESSAGE
061414  000403                           BR      $ATYC
061416  112767  000001  000220   $ATY4:  MOVB    #1,$FFLG           ;;TO ONLY REPORT FATAL ERROR
061424                           $ATYC:
061424  010046                           MOV     R0,-(SP)           ;;PUSH R0 ON STACK
061426  010146                           MOV     R1,-(SP)           ;;PUSH R1 ON STACK
061430  105767  000206                   TSTB    $MFLG              ;;SHOULD TYPE A MESSAGE?
061434  001450                           BEQ     5$                 ;;IF NOT:  BR
061436  122767  000001  116654           CMPB    #APTENV,$ENV       ;;OPERATING UNDER APT?
061444  001031                           BNE     3$                 ;;IF NOT:  BR
061446  132767  000100  116645           BITB    #APTSPOOL,$ENVM    ;;SHOULD SPOOL MESSAGES?
061454  001425                           BEQ     3$                 ;;IF NOT:  BR
061456  017600  000004                   MOV     @4(SP),R0          ;;GET MESSAGE ADDR.
061462  062766  000002  000004           ADD     #2,4(SP)                   ;;BUMP RETURN ADDR.
```

```
061470  005767  116604          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
061474  001375                          BNE     1$              ;;IF NOT:  WAIT
061476  010067  116612                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
061502  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
061504  001376                          BNE     2$
061506  166700  116602                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
061512  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
061514  010067  116576                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
061520  012767  000004  116552          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
061526  000413                          BR      5$
061530  017667  000004  000016  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
061536  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
061544  016746  116226                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
061550  004767  177332                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
061554  000000                  4$:     .WORD   0
061556                          5$:
061556  105767  000062          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
061562  001416                          BEQ     12$             ;;IF NOT:  BR
061564  005767  116530                  TST     $ENV            ;;RUNNING UNDER APT?
061570  001413                          BEQ     12$             ;;IF NOT:  BR
061572  005767  116502          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
061576  001375                          BNE     11$             ;;IF NOT:  WAIT
061600  017667  000004  116474          MOV     @4(SP),$FATAL   ;;GET ERROR #
061606  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
061614  005267  116460                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
061620  105067  000020          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
061624  105067  000013                  CLRB    $LFLG           ;;CLEAR LOG FLAG
061630  105067  000006                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
061634  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
061636  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
061640  000207                          RTS     PC              ;;RETURN
061642     000                  $MFLG:  .BYTE   0               ;;MESSG. FLAG
061643     000                  $LFLG:  .BYTE   0               ;;LOG FLAG
061644     000                  $FFLG:  .BYTE   0               ;;FATAL FLAG
        061646                          .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

061646                          $TYPDS:
061646  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
061650  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
061652  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
061654  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
```

```
061656 010546                           MOV     R5,-(SP)            ;;PUSH R5 ON STACK
061660 012746 020200                    MOV     #20200,-(SP)        ;;SET BLANK SWITCH AND SIGN
061664 016605 000020                    MOV     20(SP),R5           ;;GET THE INPUT NUMBER
061670 100004                           BPL     1$                  ;;BR IF INPUT IS POS.
061672 005405                           NEG     R5                  ;;MAKE THE BINARY NUMBER POS.
061674 112766 000055 000001             MOVB    #'-,1(SP)           ;;MAKE THE ASCII NUMBER NEG.
061702 005000                   1$:     CLR     R0                  ;;ZERO THE CONSTANTS INDEX
061704 012703 062062                    MOV     #$DBLK,R3           ;;SETUP THE OUTPUT POINTER
061710 112723 000040                    MOVB    #' ,(R3)+           ;;SET THE FIRST CHARACTER TO A BLANK
061714 005002                   2$:     CLR     R2                  ;;CLEAR THE BCD NUMBER
061716 016001 062052                    MOV     $DTBL(R0),R1        ;;GET THE CONSTANT
061722 160105                   3$:     SUB     R1,R5               ;;FORM THIS BCD DIGIT
061724 002402                           BLT     4$                  ;;BR IF DONE
061726 005202                           INC     R2                  ;;INCREASE THE BCD DIGIT BY 1
061730 000774                           BR      3$
061732 060105                   4$:     ADD     R1,R5               ;;ADD BACK THE CONSTANT
061734 005702                           TST     R2                  ;;CHECK IF BCD DIGIT=0
061736 001002                           BNE     5$                  ;;FALL THROUGH IF 0
061740 105716                           TSTB    (SP)                ;;STILL DOING LEADING 0'S?
061742 100407                           BMI     7$                  ;;BR IF YES
061744 106316                   5$:     ASLB    (SP)                ;;MSD?
061746 103003                           BCC     6$                  ;;BR IF NO
061750 116663 000001 177777             MOVB    1(SP),-1(R3)        ;;YES--SET THE SIGN
061756 052702 000060            6$:     BIS     #'0,R2              ;;MAKE THE BCD DIGIT ASCII
061762 052702 000040            7$:     BIS     #' ,R2              ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
061766 110223                           MOVB    R2,(R3)+            ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
061770 005720                           TST     (R0)+               ;;JUST INCREMENTING
061772 020027 000010                    CMP     R0,#10              ;;CHECK THE TABLE INDEX
061776 002746                           BLT     2$                  ;;GO DO THE NEXT DIGIT
062000 003002                           BGT     8$                  ;;GO TO EXIT
062002 010502                           MOV     R5,R2               ;;GET THE LSD
062004 000764                           BR      6$                  ;;GO CHANGE TO ASCII
062006 105726                   8$:     TSTB    (SP)+               ;;WAS THE LSD THE FIRST NON-ZERO?
062010 100003                           BPL     9$                  ;;BR IF NO
062012 116663 177777 177776             MOVB    -1(SP),-2(R3)       ;;YES--SET THE SIGN FOR TYPING
062020 105013                   9$:     CLRB    (R3)                ;;SET THE TERMINATOR
062022 012605                           MOV     (SP)+,R5            ;;POP STACK INTO R5
062024 012603                           MOV     (SP)+,R3            ;;POP STACK INTO R3
062026 012602                           MOV     (SP)+,R2            ;;POP STACK INTO R2
062030 012601                           MOV     (SP)+,R1            ;;POP STACK INTO R1
062032 012600                           MOV     (SP)+,R0            ;;POP STACK INTO R0
062034 104401 062062                    TYPE    ,$DBLK              ;;NOW TYPE THE NUMBER
062040 016666 000002 000004             MOV     2(SP),4(SP)         ;;ADJUST THE STACK
062046 012616                           MOV     (SP)+,(SP)
062050 000002                           RTI                         ;;RETURN TO USER
062052 023420                   $DTBL:  10000.
062054 001750                           1000.
062056 000144                           100.
062060 000012                           10.
062062 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

062072  017646  000000                  $TYPOS: MOV     @(SP),-(SP)       ;;PICKUP THE MODE
062076  116667  000001  000211                  MOVB    1(SP),$0FILL      ;;LOAD ZERO FILL SWITCH
062104  112667  000207                          MOVB    (SP)+,$OMODE+1    ;;NUMBER OF DIGITS TO TYPE
062110  062716  000002                          ADD     #2,(SP)           ;;ADJUST RETURN ADDRESS
062114  000406                                  BR      $TYPON
062116  112767  000001  000171          $TYPOC: MOVB    #1,$0FILL         ;;SET THE ZERO FILL SWITCH
062124  112767  000006  000165                  MOVB    #6,$OMODE+1       ;;SET FOR SIX(6) DIGITS
062132  112767  000005  000154          $TYPON: MOVB    #5,$OCNT          ;;SET THE ITERATION COUNT
062140  010346                                  MOV     R3,-(SP)          ;;SAVE R3
062142  010446                                  MOV     R4,-(SP)          ;;SAVE R4
062144  010546                                  MOV     R5,-(SP)          ;;SAVE R5
062146  116704  000145                          MOVB    $OMODE+1,R4       ;;GET THE NUMBER OF DIGITS TO TYPE
062152  005404                                  NEG     R4
062154  062704  000006                          ADD     #6,R4             ;;SUBTRACT IT FOR MAX. ALLOWED
062160  110467  000132                          MOVB    R4,$OMODE         ;;SAVE IT FOR USE
062164  116704  000125                          MOVB    $0FILL,R4         ;;GET THE ZERO FILL SWITCH
062170  016605  000012                          MOV     12(SP),R5         ;;PICKUP THE INPUT NUMBER
062174  005003                                  CLR     R3                ;;CLEAR THE OUTPUT WORD
062176  006105                          1$:     ROL     R5                ;;ROTATE MSB INTO ''C''
062200  000404                                  BR      3$                ;;GO DO MSB
062202  006105                          2$:     ROL     R5                ;;FORM THIS DIGIT
062204  006105                                  ROL     R5
062206  006105                                  ROL     R5
062210  010503                                  MOV     R5,R3
062212  006103                          3$:     ROL     R3                ;;GET LSB OF THIS DIGIT
062214  105367  000076                          DECB    $OMODE            ;;TYPE THIS DIGIT?
062220  100016                                  BPL     7$                ;;BR IF NO
062222  042703  177770                          BIC     #177770,R3        ;;GET RID OF JUNK
062226  001002                                  BNE     4$                ;;TEST FOR 0
062230  005704                                  TST     R4                ;;SUPPRESS THIS 0?
062232  001403                                  BEQ     5$                ;;BR IF YES
062234  005204                          4$:     INC     R4                ;;DON'T SUPPRESS ANYMORE 0'S
062236  052703  000060                          BIS     #'0,R3            ;;MAKE THIS DIGIT ASCII
062242  052703  000040                  5$:     BIS     #' ,R3            ;;MAKE ASCII IF NOT ALREADY
062246  110367  000040                          MOVB    R3,8$             ;;SAVE FOR TYPING
062252  104401  062312                          TYPE    ,8$               ;;GO TYPE THIS DIGIT
062256  105367  000032                  7$:     DECB    $OCNT             ;;COUNT BY 1
```

```
062262  003347                           BGT     2$                     ;;BR IF MORE TO DO
062264  002402                           BLT     6$                     ;;BR IF DONE
062266  005204                           INC     R4                     ;;INSURE LAST DIGIT ISN'T A BLANK
062270  000744                           BR      2$                     ;;GO DO THE LAST DIGIT
062272  012605                   6$:     MOV     (SP)+,R5               ;;RESTORE R5
062274  012604                           MOV     (SP)+,R4               ;;RESTORE R4
062276  012603                           MOV     (SP)+,R3               ;;RESTORE R3
062300  016666  000002  000004           MOV     2(SP),4(SP)            ;;SET THE STACK FOR RETURNING
062306  012616                           MOV     (SP)+,(SP)
062310  000002                           RTI                            ;;RETURN
062312     000                   8$:     .BYTE   0                      ;;STORAGE FOR ASCII DIGIT
062313     000                           .BYTE   0                      ;;TERMINATOR FOR TYPE ROUTINE
062314     000                   $OCNT:  .BYTE   0                      ;;OCTAL DIGIT COUNTER
062315     000                   $OFILL: .BYTE   0                      ;;ZERO FILL SWITCH
062316  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.

062320  010046                   $TRAP:  MOV     R0,-(SP)               ;;SAVE R0
062322  016600  000002                   MOV     2(SP),R0               ;;GET TRAP ADDRESS
062326  005740                           TST     -(R0)                  ;;BACKUP BY 2
062330  111000                           MOVB    (R0),R0                ;;GET RIGHT BYTE OF TRAP
062332  006300                           ASL     R0                     ;;POSITION FOR INDEXING
062334  016000  062354                   MOV     $TRPAD(R0),R0          ;;INDEX TO TABLE
062340  000200                           RTS     R0                     ;;GO TO ROUTINE


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

062342  011646                   $TRAP2: MOV     (SP),-(SP)             ;;MOVE THE PC DOWN
062344  016666  000004  000002           MOV     4(SP),2(SP)            ;;MOVE THE PSW DOWN
062352  000002                           RTI                            ;;RESTORE THE PSW

                                 .SBTTL  TRAP TABLE

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

                                 ;       ROUTINE
                                 ;       -------
062354  062342                   $TRPAD: .WORD   $TRAP2
062356  061106                           $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
062360  062116                           $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
062362  062072                           $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
062364  062132                           $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
062366  061646                           $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)


062370  177777                   PASSPT: -1
        000001                   .END
```

```
A        026100          8203#  8211*  8212   8215   8225   8244*  8245   8248   8258   8277*  8278*  8279*  8280
                         8283   8293   8303   8314   8331*  8332*  8333   8334*  8337   8347   8359   8369   8412
                         8414   8431*  8432   8434   8451*  8452*  8453   8470*  8471*  8472
ABASE  = 000000           345
ACDW1  = 000000           345
ACDW2  = 000000           345
ACPUOP= 000000            345    360
ADC1     020402          6420   6421   6427#
ADC2     020412          6422   6431#
ADC3     020432          6435   6436   6442#
ADC4     020442          6437   6446#
ADC5     020460          6449   6450   6451   6457#
ADDW0  = 000000           345
ADDW1  = 000000           345
ADDW10= 000000            345
ADDW11= 000000            345
ADDW12= 000000            345
ADDW13= 000000            345
ADDW14= 000000            345
ADDW15= 000000            345
ADDW2  = 000000           345
ADDW3  = 000000           345
ADDW4  = 000000           345
ADDW5  = 000000           345
ADDW6  = 000000           345
ADDW7  = 000000           345
ADDW8  = 000000           345
ADDW9  = 000000           345
ADD1     020216          6342   6343   6349#
ADD2     020226          6344   6353#
ADD3     020242          6356   6357   6363#
ADD4     020252          6358   6367#
ADD5     020270          6370   6371   6377#
ADD6     020300          6372   6381#
ADD7     020312          6382   6383   6389#
ADD8     020322          6384   6393#
ADD9     020342          6396   6397   6398   6404#
ADEVCT= 000000            345    351
ADEVM  = 000000           345
AENV   = 000000           345    356
AENVM  = 000000           345    357
AFATAL= 000000            345    348
AMADR1= 000000            345
AMADR2= 000000            345
AMADR3= 000000            345
AMADR4= 000000            345
AMAMS1= 000000            345
AMAMS2= 000000            345
AMAMS3= 000000            345
AMAMS4= 000000            345
AMSGAD= 000000            345    353
AMSGLG= 000000            345    354
AMSGTY= 000000            345    347
AMTYP1= 000000            345
AMTYP2= 000000            345
AMTYP3= 000000            345
```

AMTYP4=	000000	345							
APASS =	000000	345	350						
APRIOR=	000000	345							
APTCSU=	000040	15491	15603#						
APTENV=	000001	11013	11044	11077	11158	11203	15484	15559	15601#
APTSIZ=	000200	15600#							
APTSPO=	000100	15486	15561	15602#					
AROUN	025300	7995	7998#						
AROUND	041772	11451	11459#						
ASL1	021716	6925	6926	6927	6933#				
ASL2	021726	6928	6937#						
ASL3	021744	6940	6941	6942	6948#				
ASL4	021754	6943	6952#						
ASL5	021770	6955	6956	6962#					
ASL6	022000	6957	6966#						
ASL7	022024	6969	6970	6971	6972	6979#			
ASR1	022066	6995	6996	6997	7003#				
ASR2	022076	6998	7007#						
ASR3	022120	7011	7012	7013	7019#				
ASR4	022130	7014	7023#						
ASR5	022144	7026	7027	7028	7034#				
ASR6	022154	7029	7038#						
ASR7	022204	7042	7043	7044	7045	7052#			
ASTART	042516	11672#	11907	11911					
ASWREG=	000000	345	358						
ATESTN=	000000	345	349						
ATRAP	037562	10911	10944#						
AUNIT =	000000	345	352						
AUSWR =	000000	345	359						
AUTO1	037670	10986#							
AVECT1=	000000	345							
AVECT2=	000000	345							
BELL =	000240	8664#							
BIC1	017346	6016	6017	6023#					
BIC2	017356	6018	6027#						
BIC3	017374	6030	6031	6037#					
BIS1	017436	6052	6053	6054	6060#				
BIS2	017446	6055	6064#						
BIS3	017466	6067	6068	6069	6075#				
BITCHK	025466	8051#							
BITCLR	025416	8038#							
BITCON	025550	8064	8073#						
BITSET	025432	8044#							
BIT1	017256	5979	5980	5986#					
BIT2	017266	5981	5991#						
BIT3	017304	5994	5995	6001#					
BRA1	001074	457	463#						
BRA2	001104	458	467#						
BRA3	001116	468	476#						
BRA4	001124	477	483#						
BRA5	001134	478	487#						
BRCT	025336	7982*	8012#	8018*					
BRC1	003350	1341	1347#						
BRC2	003360	1342	1352#						
BRC3	003370	1354	1360#						
BRH	025310	7983*	8003#						

```
BRMFPD   027120     8519    8523#
BRN1     003230     1257    1263#
BRN2     003240     1258    1268#
BRN3     003250     1270    1276#
BRTAB    027214     7980    8549#
BRV1     003300     1299    1305#
BRV2     003310     1300    1310#
BRV3     003320     1312    1318#
BRZ1     003160     1210    1216#
BRZ2     003170     1211    1221#
BRZ3     003200     1223    1229#
BR1      027544     8709    8718#
BR10     027760     8797    8806#
BR11     030064     8830    8839#
BR12     030132     8845    8854#
BR13     030200     8860    8869#
BR14     030246     8875    8884#
BR15     030344     8906    8915#
BR16     030364     8916    8925#
BR17     030404     8926    8935#
BR2      027572     8721    8730#
BR20     030424     8936    8944#
BR21     030444     8945    8954#
BR22     030464     8955    8964#
BR23     030504     8965    8974#
BR3      027614     8733    8742#
BR33     030554     8994    9002#
BR34     030566     9003    9011#
BR35     030600     9012    9020#
BR36     030612     9021    9029#
BR37     030634     9032    9040#
BR4      027640     8746    8755#
BR40     030646     9041    9049#
BR41     030660     9050    9058#
BR45     032206     9463    9469#
BR46     032754     9569    9667#
BR46A    032764     9662    9671#
BR47     033544     9870    9876#
BR5      027664     8759    8768#
BR51     034312     9978    10076#
BR51A    034322     10071   10080#
BR6      027710     8772    8780#
BR7      027734     8784    8793#
BR70     037300     10844   10859#
BR71     040230     11041   11053   11062#
BTCON    025624     8092    8097#
BTERR    025610     8087    8093#
BTRAP    037636     10952   10970#
BUFF   = 001000     8672#   9074    9088    9091    9107    9110    9126    9131    9140    9145    9161    9210    9272
                    9285    9288    9304    9307    9323    9328    9337    9341    9357    9406    9467    9484    9497
                    9500    9516    9519    9535    9540    9549    9554    9570    9619    9679    9692    9695    9711
                    9714    9730    9735    9744    9749    9765    9814    9874    9892    9905    9908    9924    9927
                    9943    9948    9958    9963    9979    10028   10095   10108   10111   10127   10130   10146   10151
                    10160   10165   10181   10230   10287   10300   10303   10319   10322   10339   10344   10353   10358
                    10374   10423   10696   10712   10721   10737   10743   10762   10787   10817   10846   10871   10877
                    10912   10934   10953   10980   10996   11049   11082   11135   11164   11179   11209   11233   11254
```

```
                         11260    11476    11483    11488    11493    15446
CC      = 177776          8671#    9128*    9142*    9201     9250     9325*    9339*    9397     9446     9537*    9551*    9610     9659
                          9732*    9746*    9805     9855     9945*    9960*   10019    10068    10148*   10162*   10221    10270    10341*
                         10355*   10414    10463    11477*
CCERR     026044          8147     8185#
CC1       025304          7985*    7987*    8001#
CC2       025746          8149*    8157#    8166*    8172*
CC3       025732          8148*    8153#    8167*    8168     8170
CIS       042254         11465    11529#
CLRCD     025730          8152#    8169     8173
CLR1      020004          6234     6235     6236     6242#
CMP1      020646          6540     6541     6547#
CMP2      020656          6542     6551#
CMP3      020700          6555     6556     6562#
CMP4      020710          6557     6566#
CMP5      020734          6570     6571     6572     6578#
CMP6      020744          6573     6582#
CMP7      020764          6585     6586     6592#
COM1      021024          6608     6609     6615#
CONT      025340          7993     7997     8013#
CONTIN    061000         15407*   15413    15429    15439#
CON1      025762          8158     8166#
CON2      026054          8180     8189#
CORH      037622         10945*   10958#
COUNT     042334         11602#   11603    11647*   11689*   11698    11728*   11737    11766*   11775    11804*   11813    11843*   11853
                         11883*   11892    12285*   12311*   12328    12364*   12380    12417*   12433
CPUTYP    041620         11398*   11400    11411#
CR      = 000015         15530    15540
CRLF    = 000200         15501    15540
CTRAP     037600         10950#   10981
DAERR     025540          8037     8052     8054     8056     8058     8060     8062     8069#
DBE       041420         11343#   11351
DBE1      041442         11338    11351#
DBE2      041432         11340    11347#
DBE3      041462         11352    11360#
DBE4      041502         11361    11369#
DBE5      041520         11370    11378#
DEC1      017644          6156     6157     6158     6164#
DEC2      017654          6159     6168#
DEC3      017670          6171     6172     6178#
DEC4      017700          6173     6182#
DEC5      017714          6185     6186     6192#
DEC6      017724          6187     6196#
DEC7      017746          6200     6201     6202     6208#
DISPRE    000174           416#
DL11W     037740         10997    11001#
DL11W1    037744         10999    11002#
DNMB0A    011044          3774     3775     3776     3782#
DNMB0B    011054          3777     3786#
DNMB2A    011302          3884     3885     3886     3892#
DNMB2B    011312          3887     3896#
DNMB2C    011326          3897     3905#
DNMB2D    011342          3907     3908     3914#
DNMB2E    011352          3909     3918#
DNMB2F    011370          3920     3928#
DNMB3A    011452          3954     3955     3956     3962#
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DNMB3B  011462       3957    3966#
DNMB3C  011500       3967    3975#
DNMB3D  011516       3978    3979    3985#
DNMB3E  011526       3980    3989#
DNMB4A  011716       4057    4058    4059    4065#
DNMB4B  011726       4060    4069#
DNMB4C  011744       4070    4078#
DNMB4D  011754       4079    4085#
DNMB4E  011764       4080    4089#
DNMB4F  012000       4090    4098#
DNM03A  010136       3373    3374    3375    3381#
DNM03B  010146       3376    3385#
DNM03C  010156       3386    3393#
DNM1    010010       3307    3315#
DNM1A   011122       3807    3808    3809    3815#
DNM1B   011132       3810    3819#
DNM2    010024       3316    3324#
DNM2A   011200       3840    3841    3847#
DNM2B   011210       3842    3851#
DNM2C   011216       3858#
DNM2D   011226       3853    3862#
DNM3    010042       3326    3334#
DNM4    010064       3338    3346#
DNM4A   011610       4013    4014    4015    4021#
DNM4B   011620       4016    4025#
DNM4C   011634       4026    4034#
DNM5A   012060       4121    4122    4123    4129#
DNM5B   012070       4124    4133#
DNM5C   012106       4134    4142#
DNM6A   012166       4164    4165    4166    4172#
DNM6B   012176       4167    4176#
DNM6C   012214       4177    4185#
DNM7A   012276       4207    4208    4209    4215#
DNM7B   012306       4210    4219#
DNM7C   012324       4220    4228#
DOAGIN  060472      15372   15378#
DOPB2A  010550       3624    3632#
DOPB2B  010626       3663    3671#
DOP0A   007552       3189    3197#
DOP0B   007576       3202    3210#
DOP0C   007616       3213    3221#
DOP0D   007646       3228    3236#
DOP03A  007724       3267    3268    3269    3275#
DOP03B  007734       3270    3279#
DOP1    010362       3513    3521#
DOP2    010474       3583    3591#
DOP4    014000       4798    4810#
DOP5    014064       4836    4848#
DTRAP1  037620      10956#  10980
DUMMY = 000000      11593#  12561   12595   12630   12665   12699   12734   12769
END1    027204       8530    8543#
ENT176  046730      12539   12546#
ENT51   044270      11966   11970#
ER      025322       7979    7994    7996    8008#
ERRNM = 000442      11594#  11684   11689#  11693   11698#  11723   11728#  11732   11737#  11761   11766#  11770   11775#
                    11799   11804#  11808   11813#  11838   11843#  11847   11852#  11878   11883#  11887   11892#  11972
```

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                        11977#  11992   11997#  12000   12005#  12021   12026#  12029   12034#  12050   12055#  12058   12063#
                        12079   12084#  12087   12092#  12108   12113#  12116   12121#  12137   12142#  12145   12150#  12166
                        12171#  12174   12179#  12195   12200#  12203   12208#  12224   12229#  12232   12237#  12253   12258#
                        12261   12266#  12306   12311#  12314   12319#  12322   12327#  12330   12335#  12359   12364#  12367
                        12372#  12375   12380#  12382   12387#  12412   12417#  12420   12425#  12428   12433#  12435   12440#
                        12548   12553#  12568   12573#  12575   12580#  12582   12587#  12602   12607#  12609   12614#  12616
                        12621#  12637   12642#  12644   12649#  12652   12657#  12672   12677#  12679   12684#  12686   12691#
                        12706   12711#  12713   12718#  12720   12725#  12741   12746#  12748   12753#  12756   12761#  12776
                        12781#  12783   12788#  12790   12795#  12810   12815#  12817   12822#  12824   12829#  12831   12836#
                        12856   12861#  12863   12868#  12871   12876#  12893   12898#  12900   12905#  12908   12913#  12930
                        12935#  12937   12942#  12945   12950#  12967   12972#  12974   12979#  12982   12987#  13004   13009#
                        13011   13016#  13019   13024#  13041   13046#  13048   13053#  13056   13061#  13078   13083#  13085
                        13090#  13093   13098#  13115   13120#  13122   13127#  13130   13135#  13152   13157#  13159   13164#
                        13167   13172#  13189   13194#  13196   13201#  13204   13209#  13238   13243#  13245   13250#  13253
                        13258#  13273   13278#  13280   13285#  13288   13293#  13308   13313#  13315   13320#  13323   13328#
                        13344   13349#  13351   13356#  13359   13364#  13380   13385#  13387   13392#  13395   13400#  13415
                        13420#  13422   13427#  13430   13435#  13451   13456#  13458   13463#  13466   13471#  13487   13492#
                        13494   13499#  13502   13507#  13522   13527#  13529   13534#  13537   13542#  13557   13562#  13564
                        13569#  13572   13577#  13593   13598#  13600   13605#  13608   13613#  13629   13634#  13636   13641#
                        13644   13649#  13664   13669#  13671   13676#  13679   13684#  13699   13704#  13706   13711#  13714
                        13719#  13735   13740#  13742   13747#  13750   13755#  13771   13776#  13778   13783#  13786   13791#
                        13806   13811#  13813   13818#  13821   13826#  13842   13847#  13849   13854#  13857   13862#  13882
                        13887#  13889   13894#  13897   13902#  13917   13922#  13924   13929#  13932   13937#  13952   13957#
                        13959   13964#  13967   13972#  13987   13992#  13994   13999#  14002   14007#  14022   14027#  14029
                        14034#  14037   14042#  14057   14062#  14064   14069#  14072   14077#  14092   14097#  14099   14104#
                        14107   14112#  14127   14132#  14134   14139#  14142   14147#  14162   14167#  14169   14174#  14177
                        14182#  14197   14202#  14204   14209#  14212   14217#  14240   14245#  14248   14253#  14256   14261#
                        14263   14268#  14282   14287#  14290   14295#  14298   14303#  14305   14310#  14325   14330#  14333
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                        14410   14415#  14418   14423#  14426   14431#  14433   14438#  14453   14458#  14461   14466#  14469
                        14474#  14477   14482#  14496   14501#  14504   14509#  14512   14517#  14519   14524#  14538   14543#
                        14546   14551#  14554   14559#  14561   14566#  14580   14585#  14588   14593#  14596   14601#  14603
                        14608#  14623   14628#  14631   14636#  14639   14644#  14647   14652#  14666   14671#  14674   14679#
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                        14894#  14909   14914#  14917   14922#  14940   14945#  14948   14953#  14956   14961#  14963   14968#
                        14982   14987#  14990   14995#  14998   15003#  15005   15010#  15024   15029#  15032   15037#  15040
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                        15116   15121#  15124   15129#  15131   15136#  15150   15155#  15158   15163#  15166   15171#  15173
                        15178#  15192   15197#  15200   15205#  15208   15213#  15215   15220#  15234   15239#  15242   15247#
                        15250   15255#  15257   15262#  15276   15281#  15284   15289#  15292   15297#  15299   15304#  15318
                        15323#  15326   15331#  15334   15339#  15341   15346#
F       = 000063        11595#  11982   12011#  12040#  12069#  12098#  12127#  12156#  12185#  12214#  12243#  12272#
FINISH    042320        11453*  11471   11547#
FOVER     036526        10665   10667   10683#
FPP       042310        11453   11469   11543#
GIN1      042012        11463#  11470   11504
GIN2      042054        11474#  11505
GIN3      042102        11472   11479#
GNS     = ****** U      15779   15780   15781   15782   15783
HERE    = 000000         8678#   8707*   8719*   8807
HICORE    037472        10905*  10908*  10915#  10947
HLT     = 000000         8652#
HT      = 000011        15499   15540
IJMP      016362         5702    5705#
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IJMP5    016324     5688    5691#
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ILLB   = 000100     8670#   10653
INC1     017526     6103    6104    6110#
INC2     017536     6105    6114#
INC3     017560     6118    6119    6120    6126#
INC4     017570     6121    6131#
INC5     017604     6134    6135    6141#
INST     042322     11473*  11474*  11478   11488   11503   11548#
INSTC    031012     9109#
INSTK    035170     10321#  10322
ITRAP5=  000004     8654#
JMPCK    016364     5605    5705    5707#
JMPERR   025660     8114    8115    8116    8122#
JMPSEQ   016404     5606*   5618    5628*   5632    5641*   5653    5663*   5666    5676*   5679    5689*   5693    5703*
                    5707    5717#
JMPT     025650     8113    8114#
JMP2     016136     5607    5632#
JMP2A    016154     5633    5641#
JMP3     016064     5609#   5642
JMP3A    016102     5610    5618#
JMP3B    016122     5619    5627#
JMP4     016166     5630    5644#
JMP4A    016204     5645    5653#
JMP4B    016224     5654    5662#
JMP5     016272     5662    5679#
JMP5A    016312     5680    5688#
JMP6     016236     5666#   5691
JMP6A    016256     5667    5675#
JMP7     016326     5675    5693#
JMP7A    016346     5694    5702#
JSRCK    017036     5867    5870#
JSRCKA   017032     5864    5867#
JSRCK1   017054     5743    5871    5878#
JSRSEQ   017034     5747*   5758    5776*   5779    5797*   5801    5813*   5817    5831*   5833    5847*   5851    5863*
                    5868#   5870
JSR0     016420     5741    5743#
JSR1     016424     5742    5745#
JSR1A    016446     5753#   5781
JSR2     016536     5746    5779#   5803
JSR2A    016566     5780    5782    5784    5791#
JSR2B    016576     5786    5795#
JSR3     016456     5758#   5766    5798
JSR3A    016516     5759    5761    5763    5765    5772#
JSR3B    016526     5767    5776#
JSR4     016620     5760    5777    5801#
JSR4A    016636     5802    5809#
JSR4B    016646     5804    5813#
JSR5     016724     5814    5833#   5837    5853
JSR5A    016750     5834    5836    5843#
JSR5B    016760     5838    5847#
JSR6     016660     5817#   5835    5866
JSR6A    016704     5818    5820    5827#
JSR6AD   017030     5821    5848    5866#   5872
JSR6B    016714     5822    5831#
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JSR7     016772      5819    5832    5851#
JSR7A    017010      5852    5859#
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K1       027430      8681#   8825*   8826    8829    8840*   8841    8844    8854*   8856    8869*   8871    8884*   8886
                     8889
K10      027446      8688#   8925    8935    8944    8954    8964    8974
K11      027450      8689#
K12      027452      8690#
K2       027432      8682#
K3       027434      8683#
K4       027436      8684#
K5       027440      8685#   8824*   8827    8839*   8855*   8857    8859    8870*   8872    8874    8885*   8887
K6       027442      8686#   8842    8935
K7       027444      8687#   8905    8915    8925    8944    8974
LF     = 000012     15534   15540
LPADR    000172       415#  11672*  11702*  11712*  11740*  11750*  11778*  11788*  11816*  11826*  11856*  11866*  11896*
                    11986*  12015*  12044*  12073*  12102*  12131*  12160*  12189*  12218*  12247*  12284*  12346*  12398*
                    12560*  12594*  12628*  12664*  12698*  12732*  12768*  12802*  12848*  12885*  12922*  12959*  12996*
                    13033*  13070*  13107*  13144*  13181*  13232*  13267*  13302*  13337*  13374*  13409*  13444*  13481*
                    13516*  13551*  13586*  13623*  13658*  13693*  13728*  13765*  13800*  13835*  13876*  13911*  13946*
                    13981*  14016*  14051*  14086*  14121*  14156*  14191*  14232*  14274*  14316*  14360*  14402*  14444*
                    14488*  14530*  14572*  14614*  14658*  14700*  14742*  14786*  14828*  14870*  14900*  14932*  14974*
                    15016*  15058*  15100*  15142*  15184*  15226*  15268*  15310*
MBDM2A   012542      4342    4343    4349#
MBDM2B   012552      4344    4353#
MBDM2C   012570      4354    4362#
MBDM2D   012602      4363    4364    4370#
MBDM2E   012612      4365    4374#
MBDM2F   012630      4375    4383#
MBDM4A   013164      4526    4534#
MBDM4B   013202      4535    4543#
MBDM4C   013214      4544    4545    4551#
MBDM4D   013224      4546    4555#
MBDM4E   013240      4556    4564#
MDM1A    012374      4256    4257    4263#
MDM1B    012404      4258    4267#
MDM2A    012450      4295    4296    4302#
MDM2B    012460      4297    4306#
MDM2C    012466      4313#
MDM2D    012476      4308    4317#
MDM3A    012704      4409    4410    4416#
MDM3B    012714      4411    4420#
MDM3C    012732      4421    4429#
MDM3D    012752      4430    4438#
MDM3E    013000      4440    4448#
MDM4A    013060      4476    4477    4483#
MDM4B    013070      4478    4487#
MDM4C    013104      4488    4496#
MDM5A    013310      4594    4595    4601#
MDM5B    013320      4596    4605#
MDM5C    013336      4606    4614#
MDM5D    013354      4615    4623#
MDM5E    013402      4626    4634#
MDM6A    013452      4663    4664    4670#
MDM6B    013462      4665    4674#
MDM6C    013500      4675    4683#
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MDM6D	013520	4684	4692#			
MDM6E	013550	4695	4703#			
MDM7A	013624	4731	4732	4738#		
MDM7B	013634	4733	4742#			
MDM7C	013652	4743	4751#			
MDM7D	013672	4752	4760#			
MDM7E	013716	4762	4770#			
MFPIO	025006	7907	7912#			
MFPIOA	025034	7914	7918#			
MFPS1	023532	7518	7527#			
MFPS2A	023622	7552	7553	7554	7560#	
MFPS2B	023632	7555	7564#			
MFPS2C	023652	7565	7573#			
MFPS3A	023730	7594	7595	7596	7602#	
MFPS3B	023740	7597	7606#			
MFPS3C	023760	7607	7615#			
MFPS4A	024036	7636	7637	7638	7644#	
MFPS4B	024046	7639	7648#			
MFPS4C	024066	7649	7657#			
MFPS5A	024144	7678	7679	7680	7686#	
MFPS5B	024154	7681	7690#			
MFPS5C	024174	7691	7699#			
MFPS6A	024254	7720	7721	7722	7728#	
MFPS6B	024264	7723	7732#			
MFPS6C	024304	7733	7741#			
MFPS7A	024364	7762	7763	7764	7770#	
MFPS7B	024374	7765	7774#			
MFPS7C	024414	7775	7783#			
MFPT	= 000007	11392#	11397			
MOR0	026106	8193	8204#			
MOR1	026146	8216	8225#			
MOR2	026226	8249	8258#			
MOR3	026320	8284	8293#			
MOR4	026340	8294	8303#			
MOR5	026360	8305	8314#			
MOR6	026450	8338	8347#			
MOR7	026470	8349	8359#			
MOR8	026510	8360	8369#			
MOV1	017166	5942	5943	5949#		
MOV2	017176	5944	5954#			
MOV3	017214	5957	5958	5964#		
MRK1	022572	7228	7235#			
MRK2	022614	7235	7236	7237	7239	7246#
MRK3	022624	7241	7250#			
MRK4	022646	7253	7255#			
MRK5	022660	7254	7259#			
MRK6	022674	7260	7267#			
MSGERR	060740	15411	15432#			
MSGPWF	061066	15449	15457#			
MSG1	060550	15358	15390#			
MTPIO	025122	7933	7938#			
MTPS1	022744	7293	7301#			
MTPS1A	022764	7305	7306	7307	7313#	
MTPS2	023040	7330	7338#			
MTPS3	023130	7361	7369#			
MTPS4	023216	7391	7399#			

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MTPS6     023366          7451     7459#
MTPS7     023456          7481     7489#
N       = 000307         11596#   12556    12590#   12624#   12660#   12694#   12728#   12764#   12798#   12839#   12844    12881#   12918#
                         12955#   12992#   13029#   13066#   13103#   13140#   13177#   13214#   13228    13263#   13298#   13333#   13370#
                         13405#   13440#   13477#   13512#   13547#   13582#   13619#   13654#   13689#   13724#   13761#   13796#   13831#
                         13868#   13872    13907#   13942#   13977#   14012#   14047#   14082#   14117#   14152#   14187#   14222#   14228
                         14270#   14312#   14356#   14398#   14440#   14484#   14526#   14568#   14610#   14654#   14696#   14738#   14782#
                         14824#   14866#   14896#   14924#   14928    14970#   15012#   15054#   15096#   15138#   15180#   15222#   15264#
                         15306#   15348#
NBR       025314          7993*    7996*    8005#
NEGAT     043670         11710    11748    11786    11824    11864    11904    11908#
NEG00     004320          1799     1800     1801     1807#
NEG01     004330          1802     1812#
NEG02     004344          1813     1822#
NEG03     004360          1824     1825     1826     1832#
NEG04     004370          1827     1836#
NEG1      020522          6484     6485     6486     6492#
NEG10     004434          1856     1857     1858     1864#
NEG11     004444          1859     1869#
NEG12     004462          1870     1878#
NEG13     004476          1880     1881     1882     1888#
NEG14     004506          1883     1892#
NEG2      020532          6487     6496#
NEG20     004554          1912     1913     1914     1920#
NEG21     004564          1915     1924#
NEG22     004612          1930     1938#
NEG3      020554          6500     6501     6502     6508#
NEG30     005134          2116     2117     2118     2124#
NEG31     005144          2119     2128#
NEG32     005160          2129     2137#
NEG33     005204          2140     2148#
NEG34     005220          2149     2157#
NEG4      020564          6503     6512#
NEG40     005612          2361     2362     2363     2369#
NEG41     005622          2364     2373#
NEG42     005636          2374     2382#
NEG5      020604          6516     6517     6518     6524#
NEG50     005712          2406     2407     2408     2414#
NEG51     005722          2409     2418#
NEG52     005736          2419     2427#
NEG60     006014          2451     2452     2453     2459#
NEG61     006024          2454     2463#
NEG70     006074          2484     2485     2486     2492#
NEG71     006104          2487     2496#
NODL      040252         11043    11047    11068#
NODL1     040436         11076    11080    11102#
NODL2     040520         11111    11128#
NODL3     040770         11157    11161    11195#
NOP     = 000240           321     8665#
NOR       037466         10913#   10916
NOSUB     037604         10949    10952#
PASSPT    062370           444*   15786#
PCNO1     026542          8394#    8395
PCN1      041176         11256#   11260
PCN2      026576          8413#    8414
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PCN3      026644            8433#    8434
PCN4      026706            8452#    8453
PCN5      026746            8471#    8472
PFRES     061062           15448    15456#
POWER     042422           11634#
PROFTE    037736           10995*   11000#   11001*   11011    11042    11075    11110    11156
PS      = 177776             324#    1056*    1121*    1122     1139*    1140     1157*    1158     1175*    1176     7273#    7292     7327*
                            7329     7358*    7360     7388*    7390     7420     7448*    7450     7478*    7480     7515*    7529*    7550*
                            7592*    7634*    7676*    7718*    7760*    7808*    7810     7833*    7834*    7840*    7844*    7860*    7861*
                            7865*    7869*    7880*    7882*    7888*    7903*    7906     7908*    7912*    7926*    7928*    7932     7934*
                            7938*    8088*    8089*    8090     8093*    8097*    8154     8176     8514*    8517*    8531*    8537*
PSWORD    042336           11604#   11605    11681*   11682    11720*   11721    11758*   11759    11796*   11797    11835*   11836    11875*
                           11876    11989*   11990    12018*   12019    12047*   12048    12076*   12077    12105*   12106    12134*   12135
                           12163*   12164    12192*   12193    12221*   12222    12250*   12251    12303*   12304    12356*   12357    12409*
                           12410    12565*   12566    12599*   12600    12634*   12635    12669*   12670    12703*   12704    12738*   12739
                           12773*   12774    12807*   12808    12853*   12854    12890*   12891    12927*   12928    12964*   12965    13001*
                           13002    13038*   13039    13075*   13076    13112*   13113    13149*   13150    13186*   13187    13235*   13236
                           13270*   13271    13305*   13306    13341*   13342    13377*   13378    13412*   13413    13448*   13449    13484*
                           13485    13519*   13520    13554*   13555    13590*   13591    13626*   13627    13661*   13662    13696*   13697
                           13732*   13733    13768*   13769    13803*   13804    13839*   13840    13879*   13880    13914*   13915    13949*
                           13950    13984*   13985    14019*   14020    14054*   14055    14089*   14090    14124*   14125    14159*   14160
                           14194*   14195    14236*   14238    14278*   14280    14321*   14323    14364*   14366    14406*   14408    14449*
                           14451    14492*   14494    14534*   14536    14576*   14578    14619*   14621    14662*   14664    14704*   14706
                           14747*   14749    14790*   14792    14832*   14834    14875*   14876*   14878    14904*   14905*   14907    14936*
                           14938    14978*   14980    15020*   15022    15062*   15064    15104*   15106    15146*   15148    15188*   15190
                           15230*   15232    15272*   15274    15314*   15316
PUSRM   = 030000             330#
PWAIT     061040           15450#   15451    15453
PWAIT1    061054           15454#   15455
PWRDN     061002             442    15442#   15445
PWRUP     061012           15442    15445#
RA        033554            9873     9880#
RA1       032216            9466     9473#
RB        033542            9872*    9875#    9880*    9881
RB1       032204            9465*    9468#    9473*    9474
RC        033536            9874#    9882
RC1       032200            9467#    9475
REGR1     042664           11709    11712#
REGR2     043032           11747    11750#
REGR23    045542           12343    12346#
REGR3     043200           11785    11788#
REGR4     043344           11823    11826#
REGR5     043514           11863    11866#
REGO1     045342           12293#   12452
REG1      002032             817#     820
REG1A     002076             841#     844
REG1E     002044             818      826#
REG2      002146             865#     868
REG2A     002174             861      866      869      878#
REG2B     002222             889#     892
REG2C     002254             894      900#
REG3      002302             911#     914
REG3A     002346             935#     938
REG3E     002314             912      920#
REG4      002416             960#     963
REG4A     002462             984#     987
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REG45	045742	12395	12398#	
REG5	002532	1010#	1013	
REG5A	002576	1034#	1037	
REG5E	002544	1011	1019#	
REG6	002654	1060#	1063	
REG6A	002720	1084#	1087	
REG6E	002666	1061	1069#	
RESET2	040570	11136	11146#	
RESET3	040560	11134	11142#	
REST	024472	7820#		
RESTRT	001024	445#	15385	15456
RET	042112	11475	11483#	
RETA	030716	9073	9077#	
RETAH	030726	9075	9081#	
RETAT	036616	10697	10705#	
RETA1	031472	9273	9278#	
RETA2	032300	9485	9490#	
RETA3	033032	9680	9685#	
RETA4	033636	9893	9898#	
RETA5	034370	10096	10101#	
RETB	030752	9089	9091#	
RETBT	036664	10713	10721#	
RETB1	031516	9286	9288#	
RETB2	032324	9498	9500#	
RETB3	033056	9693	9695#	
RETB4	033662	9906	9908#	
RETB5	034414	10109	10111#	
RETC	031014	9108	9110#	
RETCT	036736	10738	10743#	
RETC1	031560	9305	9307#	
RETC2	032366	9517	9519#	
RETC3	033120	9712	9714#	
RETC4	033724	9925	9927#	
RETC5	034456	10128	10130#	
RETD	031066	9127	9131#	
RETD1	031632	9324	9328#	
RETD2	032440	9536	9540#	
RETD3	033172	9731	9735#	
RETD4	033776	9944	9948#	
RETD5	034530	10147	10151#	
RETE	031132	9141	9145#	
RETE1	031674	9338	9341#	
RETE2	032504	9550	9554#	
RETE3	033236	9745	9749#	
RETE4	034042	9959	9963#	
RETE5	034574	10161	10165#	
RETF	031202	9162	9165#	
RETF1	031744	9358	9361#	
RETF2	032554	9571	9574#	
RETF3	033306	9766	9769#	
RETF4	034112	9980	9983#	
RETF5	034644	10182	10185#	
RETG	031314	9211	9214#	
RETG1	032056	9407	9410#	
RETG2	032666	9620	9623#	

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RETG3   033420      9815     9818#
RETG4   034224     10029    10032#
RETG5   034756     10231    10234#
RETH5   035104     10288    10293#
RETJ    035130     10301    10303#
RETK    035172     10320    10322#
RETL    035244     10340    10344#
RETM    035310     10354    10358#
RETN    035360     10375    10378#
RETO    035470     10424    10427#
RETR1   041212     11255    11260#
RETR2   041270     11281    11290#
RETR3   041336     11307    11313#
RET1    042130     11484    11488#
RET2    042150     11489    11493#
RET3    042166     11494    11503#
RET4    042156     11445    11499#
RITSH   046152     12344    12396    12450    12453#
ROL1    021406      6790     6791     6792     6798#
ROL2    021416      6793     6802#
ROL3    021434      6805     6806     6807     6813#
ROL4    021444      6808     6817#
ROL5    021460      6820     6821     6827#
ROL6    021470      6822     6831#
ROL7    021512      6834     6835     6836     6843#
ROR1    021554      6858     6859     6860     6866#
ROR2    021564      6861     6870#
ROR3    021602      6873     6874     6875     6881#
ROR4    021612      6876     6885#
ROR5    021630      6888     6889     6890     6896#
ROR6    021640      6891     6900#
ROR7    021654      6903     6904     6910#
ROTX    015172      5209     5211*    5215     5228#    5243*    5245*    5247     5273*    5274     5278
ROTXAD  015316      5274*    5276*    5289#
ROT0A   014310      4938     4939     4946#
ROT0B   014320      4941     4950#
ROT0C   014342      4953     4954     4961#
ROT1A   014410      4987     4988     4995#
ROT1B   014420      4990     4999#
ROT1C   014444      5002     5003     5010#
ROT1D   014454      5005     5014#
ROT1E   014504      5019     5020     5027#
ROT2A   014556      5050     5052     5060#
ROT2B   014566      5055     5064#
ROT2C   014616      5068     5070     5077#
ROT2D   014626      5072     5081#
ROT2E   014662      5086     5088     5096#
ROT3A   014730      5119     5126#
ROT3B   014740      5121     5130#
ROT3C   014766      5133     5140#
ROT3D   014776      5135     5144#
ROT3E   015024      5147     5154#
ROT4    015100      5178     5180     5187#
ROT5    015162      5208     5214     5216     5223#
ROT6    015232      5246     5253#
ROT7    015306      5272     5277     5284#
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RTI1      037166       10819   10823#
RTI2      037200       10820   10827#
RTRAP  =  000010        8668#   9075*   9089*   9108*   9127*   9141*   9162*   9163*   9211*   9212*  11340*  11379*
RTRAP1=   000034        8659#   9273*   9286*   9305*   9324*   9338*   9358*   9359*   9407*   9408*
RTRAP2=   000020        8658#   9485*   9498*   9517*   9536*   9550*   9571*   9572*   9620*   9621*
RTRAP3=   000030        8657#   9680*   9693*   9712*   9731*   9745*   9766*   9767*   9815*   9816*
RTRAP4=   000014        8656#   9893*   9906*   9925*   9944*   9959*   9980*   9981*  10029*  10030*  10697*  10713*  10738*
RTRAP5=   000004        8655#  10096*  10109*  10128*  10147*  10161*  10182*  10183*  10231*  10232*  10288*  10301*  10320*
                       10340*  10354*  10375*  10376*  10424*  10425*  11255*  11281*  11307*  11338*  11378*
RTS1      017122        5901    5908#
RTT1      037014       10765   10768#
RTT2      037030       10766   10779#
RTT3      037072       10789   10793#
RTT4      037110       10790   10799#
RTT5      037044       10787#  10795   10802
RTT6      037130       10800   10810#
ROTRAP    037520       10917   10924#
R1ERR     002114         842     851#
R2ERR     002244         890     896#
R3ERR     002364         936     945#
R4ERR     002500         985     994#
R5ERR     002614        1035    1044#
R6ERR     002736        1085    1094#
R7TRX     040106       11012   11016   11035#
SBC1      021240        6710    6711    6712    6718#
SBC2      021250        6713    6722#
SBC3      021266        6725    6726    6727    6733#
SBC4      021276        6728    6737#
SBC5      021314        6740    6741    6742    6748#
SBC6      021324        6743    6752#
SBC7      021344        6756    6757    6763#
SB0       015350        5307    5315#
SB2       015472        5372    5380#
SB4       015616        5437    5445#
SB5       015704        5472    5491#
SB5A      015676        5477    5485#
SB5X      015714        5474*   5476    5496#   5497
SB5XAD    015716        5473    5485    5497#
SB6       015756        5515    5525#
SB6X      015766        5516*   5517    5530#
SB7       016026        5549    5559#
SB7X      016036        5550*   5564#   5565
SB7XAD    016040        5551    5565#
SCOPE  =  000240         321#
SC3       026024        8150*   8175#   8190*   8191
SC4       026040        8151*   8179#   8189*
SECPRT    027424        8539    8626#
SETBR     025174        7983#   8022
SETCC     025214        7987#   8017
SETCD     026022        8171    8174#   8192
SETUP     025156        7980#
SET2BR    025264        7992    7996#
SHL       001502         656#    659
SHLE      001516         657     665#
SHR       001616         700#    703
SHRE      001632         701     709#
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SKPMSG	060406	15357	15359#		
SKP104	037752	11004#			
SKTST2	040606	11149#			
SNMB0A	006300	2601	2602	2608#	
SNMB1A	006404	2666	2667	2673#	
SNMB1B	006414	2668	2677#		
SNMB1C	006436	2682	2683	2684	2690#
SNMB2A	006560	2758	2759	2765#	
SNMB2B	006570	2760	2769#		
SNMB2C	006604	2770	2778#		
SNMB2D	006624	2782	2783	2784	2790#
SNMB2E	006634	2785	2794#		
SNMB3A	006776	2874	2875	2881#	
SNMB3B	007006	2876	2885#		
SNMB3C	007024	2888	2889	2890	2896#
SNMB3D	007034	2891	2900#		
SNM0A	006240	2568	2569	2570	2576#
SNM1A	006342	2633	2634	2635	2641#
SNM2A	006500	2714	2715	2716	2722#
SNM2B	006510	2717	2726#		
SNM3A	006710	2826	2827	2828	2834#
SNM3B	006720	2829	2838#		
SNM4A	007104	2931	2932	2938#	
SNM4B	007114	2933	2942#		
SNM5A	007166	2974	2975	2981#	
SNM5B	007176	2976	2985#		
SNM6A	007252	3017	3018	3024#	
SNM6B	007262	3019	3028#		
SNM7A	007334	3060	3061	3067#	
SNM7B	007344	3062	3071#		
SOB1	022454	7183#	7196		
SOB2	022462	7183	7184	7190#	
SOB3	022472	7185	7194#		
SOB4	022512	7197	7198	7199	7206#
SOPA	006156	2526	2534#		
SOPB	006176	2523	2536	2543#	
SOPB0A	003566	1493	1501#		
SOPB0B	003576	1502	1509#		
SOPB1A	003710	1571	1579#		
SOPB1B	003726	1580	1583	1590#	
SOPB1C	003772	1617	1625#		
SOPB1D	004012	1630	1637#		
SOPB2A	004146	1713	1721#		
SOPB2B	004166	1725	1733#		
SOPB2C	004236	1757	1765#		
SOPB2D	004262	1771	1779#		
SOPB3A	004750	2023	2031#		
SOPB3B	004774	2034	2036	2045#	
SOPB3C	005042	2076	2084#		
SOPB3D	005064	2090	2097#		
SOPX	006142	2525#	2534*	2535*	2548
SOPXAD	006206	2537*	2548#		
SOPZA	004060	1665	1673#		
SOP0A	003424	1404	1412#		
SOP0B	003444	1415	1423#		
SOP0C	003506	1452	1460#		

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SOP0D      003532       1462    1465    1474#
SOP1A      003634       1531    1539#
SOP1B      003646       1540    1548#
SOP2B      004100       1676    1685#
SOP3A      004664       1974    1982#
SOP3B      004700       1985    1992#
SOP4A      005276       2189    2197#
SOP4B      005316       2200    2209#
SOP5A      005374       2245    2253#
SOP5B      005410       2256    2263#
SOP6A      005454       2287    2295#
SOP6B      005470       2296    2303#
SOP7A      005536       2329    2337#
SOP7B      005552       2338    2345#
START      001002        434     442#
STATUS=    177776       8666#   8993*   9030*   10924*  10925   10970*  10971   11019*  11024*  11050*  11056*  11083*  11146*
                        11166*  11169   11182*  11184   11219*  11224
STBOT      001000        431#    435     445    1120    5745    5762    5783    5795    5899    7225    7240    7259    7887
                        7889    7902    7913    7930    7939    8672   11380   11393   11427   11438   11649
STP        036536       10678   10688#
STPP       031402       9160    9258#
STPPA      031412       9253    9262#
STP3       037374       10870   10883#
STP3D      037404       10878   10887#
STP4       041144       11202   11239#
STP4E      041154       11206   11234   11243#
SUB0       007500       3149    3150    3151    3157#
SUB0A      007510       3152    3161#
SUB1       021066       6643    6644    6650#
SUB2       021076       6645    6654#
SUB3       021120       6658    6659    6665#
SUB4       021130       6660    6669#
SUB5       021146       6673    6674    6680#
SUB6       021156       6675    6684#
SUB7       021176       6687    6688    6689    6695#
SWB1       020130       6295    6296    6302#
SWB2       020140       6297    6306#
SWB3       020156       6309    6310    6311    6317#
SWR        027454       8691#   8695*   8696   11467   15408   15426
SWREG      000176        417#
SW09   =   001000       11597#
SW10   =   002000       11598#
SW11   =   004000       11599#
SW12   =   010000       11600#
SXT0       022252       7078    7079    7080    7081    7088#
SXT1       022262       7083    7092#
SXT2       022312       7098    7099    7100    7101    7108#
S0         042356       11618#
S1         042360       11619#  11620   11980   12046   12841   12852   12926
S10        042402       11628#  14926   14977
S11        042404       11629#
S2         042362       11620#  11981   12017   12842   12889
S3         042364       11621#
S4         042366       11622#
S5         042370       11623#  11624   13869   13878   13948
S6         042372       11624#  13870   13913
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S7        042374      11625#
S8        042376      11626#
S9        042400      11627#  11628   14925   14935   15019
TABLE     042200      11462   11507#
TBL1      014020       4799    4800*   4801*   4802*   4803*   4804    4820#   4838*   4839*   4840*   4841*   4842    4853
                       4854    4855    4856    4857    4875    4876*   4877*   4878*   4879*   4880    4907*   4908*   4909*
                       4910*   4911
TBL2      014104       4837    4857#   4906
TDEC1     035616      10482   10487#
TDEC2     035642      10496   10498#
TDEC3     035710      10517   10519#
TDEC4     035756      10530   10535#
TDEC6     035772      10538#
TDEC7     036002      10536   10542#
TDEC77    040070      11021   11032#
TDEC8     040060      11010   11022   11028#
TEMP1     042340      11606#  11607   11650*  11673   11713   11751   11789   11827   11868   11908*  11914*  11929*  11936*
                      11954*  11967*  12286*  12294   12347   12400   12454*  12462*  12476*  12484*  12491*  12496*  12502*
                      12533*  12540*
TEMP2     042342      11608#  11609   11651*  11676   11680   11706*  11716   11719   11744*  11754   11757   11782*  11792
                      11795   11820*  11831   11834   11860*  11871   11874   11901*  11909*  11915*  11921*  11925*  11930*
                      11937*  11942*  11948*  11955*  11961*  12287*  12295   12348   12401   12455*  12503*  12510*  12521*
                      12526*  12534*  12541*
TEMP3     042344      11610#  11611   11652*  11690   11707*  11729   11745*  11767   11783*  11805   11821*  11844   11861*
                      11884   11902*  11910*  11916*  11931*  11938*  11943*  11949*  11956*  11962*  12288*  12299   12302
                      12338*  12352   12355   12390*  12405   12408   12444*  12456*  12468*  12472*  12477*  12497*  12504*
                      12515*  12522*  12527*  12542*
TEMP4     042346      11612#  11613   11653*  11682   11721   11759   11797   11836   11876   11917*  11932*  11944*  11950*
                      11957*  11963*  11968*  12289*  12312   12341*  12365   12393*  12418   12447*  12457*  12463*  12478*
                      12485*  12511*  12516*  12528*  12543*
TEMP5     042350      11614#  12290*  12319   12340*  12372   12392*  12425   12446*  12458*  12479*  12486*  12492*  12505*
                      12529*  12535*
TEMP6     042352      11615#  12291*  12304   12357   12410   12464*  12480*  12487*  12498*  12506*  12517*  12536*  12544*
TENSAV    041770      11448*  11457#  11461
TESTN1    027456       8680    8693#
TEST1     020042       6257    6258    6259    6265#
TEST2     020052       6260    6269#
TEST3     020070       6273    6274    6280#
THRPRT    042432       8698   11480   11646#
TKB     = 177562        326#  11112
TKS     = 177560        325#
TONT1     037310      10850   10863#
TO10      027334        397    8597#  11379
TO114     027374        406    8613#
TO14      027344        399    8601#
TO244     027404        409    8617#
TO250     027414        411    8621#
TO30      027354        401    8605#
TO34      027364        403    8609#
TO4       027324        395    8593#  11378
TPB     = 177566        328#   8663#  11214*  11217*  15452*
TPS     = 177564        327#   8662#  10998   11208*  11212   11215   11218*  11446*  15450   15454
TRACE     037270      10847   10855#
TRAPA   = 000077       8667#   9076    9090    9109    9130    9144    9164    9213   11343
TRAPB     037700      10935   10959   10990#
TRAP10    041766      11449   11455#
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TRAP24  041756      11447   11452#
TRCSR = 177560       8661#  11113*  11115
TRC1    037364      10872   10875   10877#
TRPADR  037510      10919#  10934
TRT   = 000003       8653#   9894    9907    9926    9947    9962    9982   10031   10613
TR0     040220      11051   11058#
TR2     040240      11054   11066#
TR3     040366      11085   11091#
TR4     040400      11086   11096#
TR5     040370      11074   11088   11092#
TST160  046206      12345   12397   12451   12460#
TST161  046234      12461   12466#
TST162  046252      12467   12470#
TST163  046270      12471   12474#
TST164  046332      12475   12482#
TST165  046370      12483   12489#
TST166  046414      12490   12494#
TST167  046444      12495   12500#
TST170  046502      12501   12508#
TST171  046526      12509   12513#
TST172  046554      12514   12519#
TST173  046576      12520   12524#
TST174  046634      12525   12531#
TST175  046670      12532   12538#
TST176  046746      12560#
TST177  047044      12594#
TST200  047142      12628#
TST201  047244      12664#
TST202  047342      12698#
TST203  047440      12732#
TST204  047542      12768#
TST205  047640      12802#
TST206  047766      12848#
TST207  050072      12885#
TST210  050176      12922#
TST211  050302      12959#
TST212  050404      12996#
TST213  050506      13033#
TST214  050610      13070#
TST215  050714      13107#
TST216  051020      13144#
TST217  051122      13181#
TST220  051224      13232#
TST221  051322      13267#
TST222  051420      13302#
TST223  051516      13337#
TST224  051620      13374#
TST225  051716      13409#
TST226  052014      13444#
TST227  052116      13481#
TST230  052214      13516#
TST231  052312      13551#
TST232  052410      13586#
TST233  052512      13623#
TST234  052610      13658#
TST235  052706      13693#
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TST240	053204	13800#						
TST241	053302	13835#						
TST242	053420	13876#						
TST243	053516	13911#						
TST244	053614	13946#						
TST245	053712	13981#						
TST246	054006	14016#						
TST247	054102	14051#						
TST250	054176	14086#						
TST251	054274	14121#						
TST252	054372	14156#						
TST253	054466	14191#						
TST254	054562	14232#						
TST255	054672	14274#						
TST256	055002	14316#						
TST257	055116	14360#						
TST260	055226	14402#						
TST261	055336	14444#						
TST262	055452	14488#						
TST263	055562	14530#						
TST264	055672	14572#						
TST265	056002	14614#						
TST266	056116	14658#						
TST267	056226	14700#						
TST270	056336	14742#						
TST271	056452	14786#						
TST272	056562	14828#						
TST273	056672	14870#						
TST274	056764	14900#						
TST275	057066	14932#						
TST276	057176	14974#						
TST277	057306	15016#						
TST300	057416	15058#						
TST301	057524	15100#						
TST302	057632	15142#						
TST303	057740	15184#						
TST304	060050	15226#						
TST305	060160	15268#						
TST306	060266	15310#						
TST37	043716	11711	11749	11787	11825	11865	11906	11912#
TST40	043752	11913	11919#					
TST41	043766	11920	11923#					
TST42	044004	11924	11927#					
TST43	044040	11928	11934#					
TST44	044072	11935	11940#					
TST45	044124	11941	11946#					
TST46	044156	11947	11952#					
TST47	044214	11953	11959#					
TST50	044244	11960	11965#					
TST51	044322	11986#						
TST52	044404	12015#						
TST53	044466	12044#						
TST54	044550	12073#						
TST55	044630	12102#						

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TST56   044710     12131#
TST57   044770     12160#
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	8939	8948	8958	8968	8978	8997	9006	9015	9024	9035	9044	9053	9062	9095	9114
	9135	9149	9169	9178	9187	9196	9205	9218	9227	9236	9245	9256	9292	9311	9332
	9345	9365	9374	9383	9392	9401	9414	9423	9432	9441	9452	9504	9523	9544	9558
	9578	9587	9596	9605	9614	9627	9636	9645	9654	9665	9699	9718	9739	9753	9773
	9782	9791	9800	9809	9822	9831	9840	9849	9859	9912	9931	9953	9967	9987	9996
	10005	10014	10023	10036	10045	10054	10063	10074	10115	10134	10155	10169	10189	10198	10207
	10216	10225	10238	10247	10256	10265	10275	10307	10326	10348	10362	10382	10391	10400	10409
	10418	10431	10440	10449	10458	10468	10502	10523	10638	10681	10725	10747	10772	10805	10832
	10881	10929	10938	10962	10975	10984	11119	11173	11188	11228	11237	11264	11288	11317	11355
	11364	11373	11404	11497											
$$NEWT	317#	450	509	528	547	566	598	618	647	671	691	735	754	772	790
	808	832	856	880	902	926	951	975	1001	1025	1050	1075	1114	1133	1151

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          1169   1201   1248   1290   1332   1397   1444   1486   1523   1561   1606   1653   1701   1744   1790
          1846   1902   1963   2010   2064   2102   2179   2230   2277   2318   2351   2392   2438   2473   2518
          2558   2590   2622   2654   2703   2746   2813   2859   2919   2960   3004   3047   3089   3114   3139
          3181   3255   3297   3362   3406   3435   3465   3499   3541   3572   3613   3650   3691   3717   3744
          3764   3797   3830   3873   3940   4001   4045   4109   4153   4196   4245   4284   4333   4399   4466
          4515   4584   4653   4721   4793   4831   4869   4900   4929   4977   5040   5110   5168   5203   5237
          5267   5299   5333   5362   5399   5427   5467   5510   5544   5600   5736   5893   5933   5969   6006
          6042   6093   6147   6225   6248   6285   6333   6410   6474   6530   6598   6633   6700   6780   6848
          6915   6985   7068   7122   7174   7219   7283   7319   7349   7380   7410   7440   7470   7509   7542
          7584   7626   7668   7710   7752   7802   7827   7854   7896   7920   7974   8032   8082   8105   8142
          8205   8238   8271   8325   8387   8406   8425   8445   8464   8485   8506   8525   8700   8818   8899
          8986   9068   9082   9101   9120   9155   9264   9279   9298   9317   9351   9458   9478   9491   9510
          9529   9564   9673   9686   9705   9724   9759   9865   9886   9899   9918   9937   9973  10089  10102
         10121  10140  10175  10281  10294  10313  10333  10368  10475  10489  10509  10544  10559  10574  10589
         10604  10619  10644  10660  10690  10706  10731  10755  10780  10811  10839  10865  10899  11005  11036
         11069  11104  11129  11150  11197  11244  11274  11301  11332  11383  11420  11440
$$SET    15771# 15780  15781  15782  15783
.SETUP     331# 11637
.$ACT1     331#
.$APTB     331#   342
.$APTH     331#   369
.$APTY     331# 15547
.$EOP      331#
.$TRAP     331# 15748
.$TYPD     331# 15604
.$TYPE     331# 15461
.$TYPO     331# 15671

. ABS.  062372    000

 ERRORS DETECTED:  0

 CJKDBC.BIN,CJKDBC.LST/CRF/SOL/NL:TOC=CJKDBC.P11
 RUN-TIME: 144 183 20 SECONDS
 RUN-TIME RATIO: 623/348=1.7
 CORE USED:  25K  (49 PAGES)
```