000000 .REPT 0

IDENTIFICATION

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

PRODUCT NAME: 11/34 EIS INSTRUCTION TESTS

DATE CREATED: DECEMBER 22, 1975

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: GLENN JOHNSON

CONTENTS

1. ABSTRACT

THIS PROGRAM TESTS THE 11/34 EXTENDED INSTRUCTION SET
(ASH, ASHC, MUL, AND DIV) USING REGISTERS 0-5 AT-
LEAST ONCE WITH EACH INSTRUCTION.
THE PROGRAM SHOULD BE RUN FOR
AT LEAST 2 PASSES WITH ALL SWITCHES LOW. THE PROGRAM IS
DESIGNED TO RUN UNDER APT. AND ACT. SYSTEMS.
THIS PROGRAM IS A MODIFICATION OF THE LSI-11 EIS TEST.
IT HAS BEEN MODIFIED TO ACCOUNT FOR ANY LSI-11 - 11/34 DIFFERENCES.

2. REQUIREMENTS

2.1 EQUIPMENT

11/34 STANDARD COMPUTER
AND 4K OF MEMORY

2.2 STORAGE

PROGRAM STORAGE - THE ROUTINES USE MEMORY 0 - 17500

2.3 PRELIMINARY PROGRAMS

NONE

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5.1 (ALL LOW FOR WORST CASE TESTING.

4.2 STARTING ADDRESS

AFTER LOADING THE PROGRAM IT SHOULD ALWAYS BE STARTED AT 200.
IF IT IS DESIRED TO SAVE THE PASS COUNTER THEN THE PROGRAM
SHOULD BE RESTARTED AT LOCATION RESTR ;I.E. 2221 OTHERWISE THE
PROGRAM CAN BE RESTARTED AT 200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 STAND ALONE

1) LOAD PROGRAM INTO MEMORY USING ABS LOADER.
2) SET SWITCHES (SEE SEC 5.1) ALL LOW FOR WORST CASE.
3) START AT 200.
4) THE PROGRAM WILL LOOP AND "END PASS" WILL BE TYPED AFTER
   COMPLETION OF FIRST PASS AND EVERY 4TH PASS. HOWEVER TYPE
   OUT WILL BE SUPPRESSED IF BIT 5 OF LOCATION $ENVM IS HIGH
5) A MINIMUM OF TWO PASSES SHOULD ALWAYS BE RUN.

4.3.2 UNDER APT

LOAD THE PROGRAM AND START AFTER SETTING THE DESIRED SWITCHES
(SEE SEC. 5.1).

5. OPERATING PROCEDURE

5.1 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 PRINTOUT

AN 8 BIT BYTE $ENVM (I.E. LOCATION 421) 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 040000 IN
LOCATION 420

5.3 SUBROUTINE ABSTRACTS

5.3.1 HALT ROUTINE

THIS ROUTINE CALLED VIA JSR INSTRUCTION IS USED EACH TIME AN ERROR IS SEEN AND AN ERROR MESSAGE OF THE FORMAT GIVEN IN SEC. 6.1 IS TYPED OUT UNLESS SUPRESSED BY THE SWITCHES DEFINED IN SEC. 5.1

5.3.2 TRAP CATCHER

A ".+2" - "HALT" SEQUENCE IS REPEATED FROM 0-776 TO CATCH ANY UNEXPECTED TRAPS. THUS ANY UNEXPECTED TRAPS OR INTERRUPTS WILL HALT AT THE VECTOR +2.

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

ADR ERRNM

WHERE:

ADR = ADDRESS OF ERROR
ERRNM = ERROR NUMBER
IN MOST CASES THE COMMENT BESIDE THE CALL FOR HALT SUBROUTINE TELLS WHAT WAS BEING CHECKED AND WHAT WAS EXPECTED. ALL PRINTOUTS WILL BE SUPPRESSED WHEN BIT 5 OF LOCATION SENVM IS HIGH. WHILE RUNNING UNDER APT THE DIAGNOSTIC WILL NOT SUPPORT SPOOLING OF CONSOLE OUTPUTS.

6.2 ERROR RECOVERY

RESTART AT 200 OR 222 (SEE SEC 4.2).

7. RESTRICTIONS

NONE

8. MISCELLANEOUS

9.1 EXECUTION TIME

NORMALLY FIRST "END PASS" WILL BE TYPED WITHIN 1 SECOND AND
WITHIN 10 SECONDS FOR EVERY CONSECUTIVE 400 PASSES

9.2 STACK POINTER

STACK IS INITIALLY SET TO 600

9.3 PASS COUNT

A 16 BIT LOCATION "$PASS" (I.E. LOCATION 406) IS USED TO KEEP
PASS COUNT. IT CAN BE CLEARED BY RESTARTING THE PROGRAM AT 200

9.4 TEST NUMBER

A 16 BIT LOCATION "STESTN" (I.E. LOCATION 404) IS USED TO KEEP TRACK
OF THE TEST NUMBER. UPPER BYTE OF THIS LOCATION GIVES THE ITERATION
NUMBER AND THE LOWER BYTE THE TEST THAT WAS BEING EXECUTED

9.5 POWER FAIL

THE DIAGNOSTIC CAN BE POWER FAILED WITH NO ERRORS. TO SEE
START THE TEST AS USUAL AND POWER DOWN THEN UP AT ANY TIME.
THE PROGRAM SHOULD RESTART FROM TEST 0 AFTER TYPING "POWER"
WITH NO ERRORS. HOWEVER IF THE PROGRAM IS STORED IN A MOS
MEMORY THAT CAN NOT HOLD DATA WITH POWER DOWN THEN THE PROGRAM
WILL NOT RECOVER FROM A POWER FAIL

5. PROGRAM DESCRIPTION

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 HAVE A
PASS WITH T BIT SET.

.END

```
    009
```

```
DFKACA  MACY11 30.(1046)  04-AUG-77  14:09  PAGE 8
DFKACA.SRC     18-NOV-75 00:00

                                        .ABS
                                        .NLIST  MD,MC,CND
                                        .LIST   ME
                                        .TITLE  DFKACA
                                        ;*COPYRIGHT (C) DECEMBER 1975
                                        ;*DIGITAL EQUIPMENT CORP.
                                        ;*MAYNARD, MASS. 01754
                                        ;*
                                        ;*PROGRAM BY GLENN JOHNSON
                                        ;*
                                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                        ;*PACKAGE (MAINDEC-11-DZQAC-B1.,AUG 29,1975.
                                        ;*
                000001                  $TN=1
                160000                  $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 9
DFKACA.SRC    18-NOV-75 00:00

                                ;*****************************************************************
                                ;*****************************************************************
                                ;*****************************************************************

                                .SBTTL  ACT11 HOOKS
                                ;HOOKS REQUIRED BY ACT11
                                        $SVPC=.                 ;SAVE PC
                                        .=46
000046  016356                  $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .SCP
                                .=52
000052  000000                  .WORD   0               ;;2)SET LOC.52 TO ZERO
                                .=$SVPC                 ;; RESTORE PC.

                                DUMMY=  0
                                ERRNM=  1
                                F=      51
                                N=      176
                                PC=     %7
                                SP=     %6
                                SCOPE=  10701
                                SCOPE1= 10701
                                SCOPE3= 10703
                                SW03=   1000
                                SW10=   2000
                                SW11=   4000
                                SW12=   10000
                                TYPE=   IOT


                                .=20
000020  016624                  $TYPE
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 10
DFKACA.SRC    18-NOV-75 00:00          ACT11 HOOKS

  364           000400                  .=400
  365                                   ;*********************************************************************
  366
  367                                   .SBTT_  APT MAILBOX-ETABLE
  368
  369
  370
  371                                           .EVEN
  372  000400                           $MAIL:                  ;;APT MAILBOX
  373  000400  000000                  $MSGTY: .WORD   AMSGTY   ;;MESSAGE TYPE CODE
  374  000402  000000                  $FATAL: .WORD   AFATAL   ;;FATAL ERROR NUMBER
  375  000404  000000                  $TESTN: .WORD   ATESTN   ;;TEST NUMBER
  376  000406  000000                  $PASS:  .WORD   APASS    ;;PASS COUNT
  377  000410  000000                  $DEVCT: .WORD   ADEVCT   ;;DEVICE COUNT
  378  000412  000000                  $UNIT:  .WORD   AUNIT    ;;I/O UNIT NUMBER
  379  000414  000000                  $MSGAD: .WORD   AMSGAD   ;;MESSAGE ADDRESS
  380  000416  000000                  $MSGLG: .WORD   AMSGLG   ;;MESSAGE LENGTH
  381  000420                           $ETABLE:                ;;APT ENVIRONMENT TABLE
  382  000420     000                   $ENV:   .BYTE   AENV     ;;ENVIRONMENT BYTE
  383  000421     000                   $ENVM:  .BYTE   AENVM    ;;ENVIRONMENT MODE BITS
  384  000422  000000C                  $SWREG: .WORD   ASWREG   ;;APT SWITCH REGISTER
  385  000424  000000                  $USWR:  .WORD   AUSWR    ;;USER SWITCHES
  386  000426  000000                  $CPUOP: .WORD   ACPUOP   ;;CPU TYPE,OPTIONS
  387                                   ;*                      BITS 15-11=CPU TYPE
  388                                   ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
  389                                   ;*                              11/70=06,PDQ=07,Q=10
  390                                   ;*                      BIT 10=REAL TIME CLOCK
  391                                   ;*                      BIT  9=FLOATING POINT PROCESSOR
  392                                   ;*                      BIT  8=MEMORY MANAGEMENT
  393  000430                           $ETEND:
  394                                           .MEXIT
  395
  396                                   ;*********************************************************************
  397
  398                                   .SBTTL  APT PARAMETER BLOCK
  399                                   ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
  400                                   ;*********************************************************************
  401           000430                          .$X=.   ;;SAVE CURRENT LOCATION
  402           000024                  .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
  403  000024   000200                 200     ;;FOR APT START UP
  404           000044                  .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
  405  000044   000430                 $APTHDR ;;POINT TO APT HEADER BLOCK
  406           000430                  .=.$X   ;;RESET LOCATION COUNTER
  407                                   ;*********************************************************************
  408                                   ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
  409                                   ;INTERFACE SPEC.
  410
  411  000430                           $APTHD:
  412  000430  000000                  $HIBTS: .WORD   0        ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
  413  000432  000400                  $MBADR: .WORD   $MAIL    ;;ADDRESS OF APT MAILBOX (BITS 0-15)
  414  000434  000003                  $TSTM:  .WORD   3        ;;RUN TIM OF LONGEST TEST
  415  000436  000005                  $PASTM: .WORD   5        ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
  416  000440  000000                  $UNITM: .WORD            ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
  417  000442  000014                          .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
  418
  419           000430                          .=$APTHD
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 11
DFKACA.SRC    18-NOV-75 00:00            APT PARAMETER BLOCK

000430                                   COUNT:
                000432                           .=COUNT+2
000432                                   PSWORD:
                000434                           .=PSWORD+2
000434                                   TEMP1:
                000436                           .=TEMP1+2
000436                                   TEMP2:
                000440                           .=TEMP2+2
000440                                   TEMP3:
                000442                           .=TEMP3+2
000442                                   TEMP4:
                000444                           .=TEMP4+2
000444  000000                           TEMP5:  .WORD
000446  000000                           TEMP6:  .WORD
000450     000                           TYPCNT: .BYTE
000451     000                           $TPCNT: .BYTE
000452  000007                           S0:     7
000454  177771                           S1:     -7
000456  000454                           S2:     S1
000460  177772                           S3:     -6
000462  177777                           S4:     -1
000464  040000                           S5:     40000
000466  000464                           S6:     S5
000470  040000                           S7:     40000
000472  177776                           S8:     -2
000474  000002                           S9:     2
000476  000474                           S10:    S9
000500  000002                           S11:    2
000502  177570                           SWR:    177570
000504  177570                           DISPLAY:        177570
000506  000064                           TTYOUT: 64
000510  177566                           $TPB:   177566
000512  177564                           $TPS:   177564
000514  005015  020040  000040  $CRLF:  .ASCIZ  <15><12>/   /
000522  006412  047520  042527  POWER:  .ASCIZ  <12><15>/POWER-
000530  000122
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 12
DFKACA.SRC    18-NOV-75 00:00          STARTING OF THE PROGRAM

                000200                  .=200
000200  012737  016410  000024          MOV     #$PWRDN,@#24    ;PREPARE TO SERVICE POWER DOWN ROUTINE
000206  012700  000410                  MOV     #$DEVCT,R0      ;PREPARE TO INITIALIZE THE STACK
000212  005040                  2$:     CLR     -(R0)
000214  022700  000400                  CMP     #$MAIL,R0
000220  001374                          BNE     2$
000222  000167  000352          RESTRT: JMP     BEGIN

                000600                  .=600

000600  012705  000404          BEGIN:  MOV     #$TESTN,R5      ;MAKE R5 POINT TO THE LOCATION $TESTN
000604  005037  000430                  CLR     @#COUNT         ;CLEAR THE COUNTER
000610  012715  000001                  MOV     #1,(R5)         ;INITIALIZE TEST NUMBER
000614  012706  000600                  MOV     #BEGIN,SP       ;** STACK AT BEGIN **
000620  013746  000004                  MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
000624  013746  000006                  MOV     @#6,-(SP)
000630  012767  000644  177146          MOV     #1$,4           ;;SET UP TIME OUT VECTOR
000636  005777  177640                  TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
000642  000407                          BR      3$              ;;BRANCH IF NO TIMEOUT TRAP OCCURS
000644  012767  000176  177630  1$:     MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
000652  012767  000174  177624          MOV     #DISPREG,DISPLAY;;POINT TO SOFTWARE DISPLAY REG
000660  022626                          CMP     (SP)+,(SP)+     ;;RESTORE STACK
000662  012637  000006          3$:     MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
000666  012637  000004                  MOV     (SP)+,@#4
000672  106427  000000                  MTPS    #0              ;PLACE #0 IN PSW
000676  132737  000001  000420          BITB    #1,@#$ENV       ;ARE WE UNDER APT ?
000704  001403                          BEQ     2$              ;IF NOT THEN GO TO 2$
000706  012767  000422  177566          MOV     #$SWREG,SWR     ;USE APT SWITCH REGISTER
000714  012737  000001  000434  2$:     MOV     #1,@#TEMP1      ;TEMP1=1
000722  005037  000436                  CLR     @#TEMP2         ;TEMP2=0
000726  012737  000001  000440          MOV     #1,@#TEMP3      ;TEMP3=1
000734  005037  000442                  CLR     @#TEMP4         ;TEMP4=0
```

```
                                        ;*********************************
                                        ;     ASH INSTRUCTION TESTS
                                        ;*********************************
                                                ;************
                                                ; TESTS 1-36
                                                ;************
000740 010701                   START:  SCOPE1
000742 013700 000434                    MOV     @#TEMP1,%0      ;LOAD R0 WITH THE CONTENTS OF TEMP1
000746 032737 000001 000406             BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
000754 001004                           BNE     2$              ;IF NOT THEN GO TO 2$
000756 013701 000436                    MOV     @#TEMP2,R1      ;OTHERWISE EXECUTE THE INSTRUCTION
                                                                ;IN MODE 0 USING R1
000762 072001                           ASH     R1,R0
000764 000402                           BR      4$
000766 072067 177444            2$:     ASH     TEMP2,%0        ;SHIFT R0 BY THE NUMBER SPECIFIED BY TEMP2
000772 106737 000432            4$:     MFPS    @#PSWORD        ;SAVE PS
000776 123737 000442 000432             CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
001004 001403                           BEQ     .+10
001006 004767 015426                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
001012 000001                           1
001014 005237 000430                    INC     @#COUNT         ;INCREMENT THE COUNTER
001020 023700 000440                    CMP     @#TEMP3,%0      ;IS THE RESULT IN R0 EQUAL TO TEMP3?
001024 001403                           BEQ     .+10
001026                          6$:
001026 004767 015406                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;EITHER INCORRECT R0 OR INCORRECT SEQUENCE
001032 000002                           2
001034 021537 000430                    CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE
                                                                ;COUNTER?
001040 001372                           BNE     6$              ;IF NOT GO TO THE HLT ABOVE
001042 005215                           INC     (R5)
001044 010701                           SCOPE1
001046 021527 000037                    CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                ;BY 14. AND RIGHT BY 14.?
001052 002011                           BGE     8$
001054 005237 000436                    INC     @#TEMP2
001060 006367 177354                    ASL     TEMP3           ;SHIFT TEMP3 LEFT.
001064 021527 000020                    CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
001070 001004                           BNE     REG1
001072 000167 000764                    JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
001076 004767 001006            8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
001102 010703                   REG1:   SCOPE3
001104 013701 000434                    MOV     @#TEMP1,%1      ;LOAD R1 WITH THE CONTENTS OF TEMP1
001110 032737 000001 000406             BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
001116 001004                           BNE     2$              ;IF NOT THEN GO TO 2$
001120 013702 000436                    MOV     @#TEMP2,R2      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 2
001124 072102                           ASH     R2,R1           ;USING R1
001126 000402                           BR      4$
```

```
DFRACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 14
DFRACA.SRC    18-NOV-75 00:00          ASH INSTRUCTION TESTS

   556  001130  072167  177302          2$:     ASH     TEMP2,%1        ;SHIFT R1 BY THE NUMBER SPECIFIED BY TEMP2
   557  001134  106737  000432          4$:     MFPS    @#PSWORD        ;SAVE PS
   558  001140  123737  000442  000432          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
   559  001146  001403                          BEQ     .+10
   560  001150  004767  015264                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO C
   561.
   562  001154  000003                          3
   563  001156  005237  000430                  INC     @#COUNT         ;INCREMENT THE COUNTER
   564  001162  023701  000440                  CMP     @#TEMP3,%1      ;IS THE RESULT IN R1 EQUAL TO TEMP3?
   565  001166  001403                          BEQ     .+10
   566  001170                          6$:
   567  001170  004767  015244                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;EITHER INCORRECT R1 OR INCORRECT SEQUENCE
   568
   569  001174  000004                          4
   570  001176  021537  000430                  CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
   571  001202  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
   572  001204  005215                          INC     (R5)
   573  001206  010703                          SCOPE3
   574  001210  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT
                                                                        ;BY 14. AND RIGHT BY 14.?
   575
   576  001214  002011                          BGE     8$
   577  001216  005237  000436                  INC     @#TEMP2
   578  001222  006367  177212                  ASL     TEMP3           ;SHIFT TEMP3 LEFT
   579  001226  021527  000020                  CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
   580  001232  001004                          BNE     REG2
   581  001234  000167  000622                  JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
   582  001240  004767  000644          8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
   583  001244  010701                  REG2:   SCOPE1
   584  001246  013702  000434                  MOV     @#TEMP1,%2      ;LOAD R2 WITH THE CONTENTS OF TEMP1
   585  001252  032737  000001  000436          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
   586  001260  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
   587  001262  013703  000436                  MOV     @#TEMP2,R3      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE C
   588  001266  072203                          ASH     R3,R2           ;USING R2
   589  001270  000402                          BR      4$
   590  001272  072267  177140          2$:     ASH     TEMP2,%2        ;SHIFT R2 BY THE NUMBER SPECIFIED BY TEMP2
   591  001276  106737  000432          4$:     MFPS    @#PSWORD        ;SAVE PS
   592  001302  123737  000442  000432          CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
   593  001310  001403                          BEQ     .+10
   594  001312  004767  015122                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO C
   595
   596  001316  000005                          5
   597  001320  005237  000430                  INC     @#COUNT
   598  001324  023702  000440                  CMP     @#TEMP3,%2      ;IS THE RESULT IN R2 EQUAL TO TEMP3?
   599  001330  001403                          BEQ     .+10
   600  001332                          6$:
   601  001332  004767  015102                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;EITHER INCORRECT R2 OR INCORRECT SEQUENCE
   602
   603  001336  000006                          6
   604  001340  021537  000430                  CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
   605  001344  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
   606  001346  005215                          INC     (R5)
   607  001350  010701                          SCOPE1
   608  001352  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                        ;LEFT BY 14. AND RIGHT BY 14.
   609
   610  001356  002011                          BGE     8$
   611  001360  005237  000436                  INC     @#TEMP2
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 15
DFKACA.SRC    18-NOV-75 00:00          ASH INSTRUCTION TESTS

   6:2  001364  006367  177050                    ASL     TEMP3           ;SHIFTED TEMP3 LEFT
   6:3  001370  021527  000020                    CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
   6:4  001374  001004                            BNE     REG3
   6:5  001376  000167  000460                    JMP     NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
   6:6  001402  004767  000502            8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
   6:7  001406  010701                    REG3:   SCOPE1
   6:8  001410  013703  000434                    MOV     @#TEMP1,%3      ;LOAD R3 WITH THE CONTENTS OF TEMP1
   6:9  001414  032737  000001  000406            BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
   6:10 001422  001004                            BNE     2$              ;IF NOT THEN GO TO 2$
   6:11 001424  013704  000436                    MOV     @#TEMP2,R4      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 1
   6:12 001430  072304                            ASH     R4,R3           ;USING R3
   6:13 001432  000402                            BR      4$
   6:14 001434  072367  176776            2$:     ASH     TEMP2,%3        ;SHIFT R3 BY THE NUMBER SPECIFIED BY TEMP2
   6:15 001440  106737  000432            4$:     MFPS    @#PSWORD        ;SAVE PS
   6:16 001444  123737  000442  000432            CMPB    @#TEMP4,@#PSWORD;IS THE PS = TEMP4 ?
   6:17 001452  001403                            BEQ     .+10
   6:18 001454  004767  014760                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                          ;THE PS IS NOT EQUAL TO 0.
   6:19 001460  000007                            7
   6:20 001462  005237  000430                    INC     @#COUNT
   6:21 001466  023703  000440                    CMP     @#TEMP3,%3      ;IS THE RESULT IN R3 EQUAL TO TEMP3?
   6:22 001472  001403                            BEQ     .+10
   6:23 001474                            6$:
   6:24 001474  004767  014740                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                          ;EITHER INCORRECT R3 OR INCORRECT SEQUENCE
   6:25 001500  000010                            10
   6:26 001502  021537  000430                    CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER?
   6:27 001506  001372                            BNE     6$              ;IF NOT GO TO THE HLT ABOVE
   6:28 001510  005215                            INC     (R5)
   6:29 001512  010701                            SCOPE1
   6:30 001514  021527  000037                    CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                          ;LEFT BY 14, AND RIGHT BY 14.?
   6:31 001520  002010                            BGE     8$
   6:32 001522  005237  000436                    INC     @#TEMP2
   6:33 001526  006367  176706                    ASL     TEMP3           ;SHIFT TEMP3 LEFT?
   6:34 001532  021527  000020                    CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
   6:35 001536  001003                            BNE     REG4
   6:36 001540  000550                            BR      NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
   6:37 001542  004767  000342            8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
   6:38 001546  010703                    REG4:   SCOPE3
   6:39 001550  013704  000434                    MOV     @#TEMP1,%4      ;LOAD R4 WITH THE CONTENTS OF TEMP1
   6:40 001554  010501                            MOV     R5,R1           ;SAVE R5
   6:41 001556  032737  000001  000406            BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
   6:42 001564  001004                            BNE     2$              ;IF NOT THEN GO TO 2$
   6:43 001566  013705  000436                    MOV     @#TEMP2,R5      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 1
   6:44 001572  072405                            ASH     R5,R4           ;USING R4
   6:45 001574  000402                            BR      4$
   6:46 001576  072467  176634            2$:     ASH     TEMP2,%4        ;SHIFT R4 BY THE NUMBER SPECIFIED BY TEMP2
   6:47 001602  106737  000432            4$:     MFPS    @#PSWORD        ;SAVE PS
   6:48 001606  123737  000442  000432            CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
   6:49 001614  001403                            BEQ     .+10
   6:50 001616  004767  014616                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                          ;THE PS IS NOT EQUAL TO 0
   6:51 001622  000011                            11
   6:52 001624  005237  000430                    INC     @#COUNT
   6:53 001630  023704  000440                    CMP     @#TEMP3,%4      ;IS THE RESULT IN R4 EQUAL TO TEMP3?
```

```
001634  001403                          BEQ     .+10
                                6$:
001636
001636  004767  014576                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;EITHER INCORRECT R4 OR INCORRECT SEQUENCE
001642  000012                          12
001644  010105                          MOV     R1,R5           ;RESTORE R5
001646  021537  000430                  CMP     (R5),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER
001652  001371                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
001654  005215                          INC     (R5)
001656  010701                          SCOPE1
001660  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN
                                                                ;SHIFTED LEFT BY 14. AND RIGHT BY 14.?
001664  002010                          BGE     8$
001666  005237  000436                  INC     @#TEMP2
001672  006367  176542                  ASL     TEMP3           ;SHIFT TEMP3 LEFT
001676  021527  000020                  CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTER BEEN SHIFTED BY 14.?
001702  001003                          BNE     REGS
001704  000466                          BR      NEGAT           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
001706  004767  000176          8$:     JSR     PC,TST37        ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
001712  010701                  REGS:   SCOPE1
001714  010501                          MOV     R5,R1           ;SAVE R5
001716  013705  000434                  MOV     @#TEMP1,%5      ;LOAD R5 WITH THE CONTENTS OF TEMP1
001722  032737  000001  000436          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
001730  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
001732  013700  000436                  MOV     @#TEMP2,R0      ;OTHERWISE EXECUTE ASH INSTRUCTION IN MODE 0
001736  072500                          ASH     R0,R5           ;USING R5
001740  000402                          BR      4$
001742  072567  176470          2$:     ASH     TEMP2,%5        ;SHIFT R5 BY THE NUMBER SPECIFIED BY TEMP2
001746  106737  000432          4$:     MFPS    @#PSWORD        ;SAVE PS
001752  123737  000442  000432          CMPB    @#TEMP4,@#PSWORD;IS PS = TEMP4 ?
001760  001403                          BEQ     .+10
001762  004767  014452                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0.
001766  000013                          13
001770  005237  000430                  INC     @#COUNT
001774  023705  000440                  CMP     @#TEMP3,%5      ;IS THE RESULT IN R5 EQUAL TO TEMP3?
002000  001403                          BEQ     .+10
                                6$:
002002  004767  014432                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;EITHER INCORRECT R5 OR INCORRECT SEQUENCE
002006  000014                          14
002010  021137  000430                  CMP     (R1),@#COUNT    ;IS THE TEST NUMBER EQUAL TO THE COUNTER
002014  001372                          BNE     6$              ;IF NOT GO TO THE HLT ABOVE
002016  010105                          MOV     R1,R5           ;RESTORE R5
002020  005215                          INC     (R5)
002022  010701                          SCOPE1
002024  021527  000037                  CMP     (R5),#37        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED
                                                                ;LEFT BY 14. AND RIGHT BY 14.?
002030  002010                          BGE     8$              ;IF SO GO AND CONTINUE THE REST OF THE PROGRAM
002032  005237  000436                  INC     @#TEMP2
002036  006367  176376                  ASL     TEMP3           ;SHIFT TEMP3 LEFT
002042  021527  000020                  CMP     (R5),#20        ;HAS THE CONTENTS OF REGISTERS BEEN SHIFTED LEFT BY 14.?
002046  001406                          BEQ     NEGA+           ;IF SO GO TO NEGAT AND INITIATE RIGHT SHIFT
002050  000466                          BR      10$
002054  004767  000032          8$:     JSR     PC,TST37
002060  000167  176666          10$:    JMP     START           ;GO BACK TO START
```

```
002062 012737 040000 000434 NEGAT: MOV  #40000,@#TEMP1 ;TEMP1=40000
002070 012737 177762 000436        MOV  #177762,@#TEMP2 ;TEMP2=177762
002076 012737 000001 000440        MOV  #1,@#TEMP3      ;TEMP3=1
002104 000167 176630               JMP  START
002110 021527 000037        TST37: CMP  (R5),#37        ;IS IT TEST 37?
002114 001013                      BNE  TST40           ;IF NOT THEN TRY TEST 40
002116 005037 000434               CLR  @#TEMP1         ;0
002122 012737 000020 000436        MOV  #16.,@#TEMP2    ;SHIFTED BY 16
002130 005037 000440               CLR  @#TEMP3         ;IS=0
002134 012737 000004 000442        MOV  #4,@#TEMP4      ;AND PS=4
002142 000207                      RTS  PC
002144 021527 000040        TST40: CMP  (R5),#40        ;IS IT TEST 40?
002150 001003                      BNE  TST41           ;IF NOT THEN TRY TEST 41
002152 005037 000436               CLR  @#TEMP2         ;0 SHIFTED BY 0=0 AND PS=4
002156 000207                      RTS  PC
002160 021527 000041        TST41: CMP  (R5),#41        ;IS IT TEST 41?
002164 001004                      BNE  TST42           ;IF NOT THEN TRY TEST 42
002166 012737 177760 000436        MOV  #-16.,@#TEMP2   ;0 SHIFTED BY -16.=0 AND PS=4
002174 000207                      RTS  PC
002176 021527 000042        TST42: CMP  (R5),#42        ;IS IT TEST 42?
002202 001013                      BNE  TST43           ;IF NOT THEN TRY TEST 43
002204 012737 100000 000434        MOV  #100000,@#TEMP1 ;100000
002212 005237 000436               INC  @#TEMP2         ;SHIFTED BY -15
002216 005337 000440               DEC  @#TEMP3         ;IS=-1
002222 012737 000010 000442        MOV  #10,@#TEMP4             ;AND PS=10
002230 000207                      RTS  PC
002232 021527 000043        TST43: CMP  (R5),#43        ;IS IT TEST 43?
002236 001012                      BNE  TST44           ;IF NOT THEN IF NOT THEN TRY TEST 44
002240 012737 125252 000434        MOV  #125252,@#TEMP1 ;125252
002246 012737 177777 000436        MOV  #-1,@#TEMP2     ;SHIFTED BY -1
002254 012737 152525 000440        MOV  #152525,@#TEMP3 ;IS=152525 AND PS=10
002262 000207                      RTS  PC
002264 021527 000044        TST44: CMP  (R5),#44        ;IS IT TEST 44?
002270 001012                      BNE  TST45           ;IF NOT THEN TRY TEST 45
002272 012737 000001 000436        MOV  #1,@#TEMP2      ;125252 SHIFTED BY 1
002300 012737 052524 000440        MOV  #52524,@#TEMP3  ;IS=52524
002306 012737 000003 000442        MOV  #3,@#TEMP4      ;AND PS=3
002314 000207                      RTS  PC
002316 021527 000045        TST45: CMP  (R5),#45        ;IS IT TEST 45?
002322 001012                      BNE  TST46           ;IF NOT THEN TRY TEST 46
002324 012737 177776 000436        MOV  #-2,@#TEMP2     ;125252 SHIFTED BY -2
002332 012737 165252 000440        MOV  #165252,@#TEMP3 ;IS=165252
002340 012737 000011 000442        MOV  #11,@#TEMP4     ;AND PS=11
002346 000207                      RTS  PC
002350 021527 000046        TST46: CMP  (R5),#46        ;IS IT TEST 46?
002354 001014                      BNE  TST47           ;IF NOT THEN TRY TEST 47
002356 012737 177777 000434        MOV  #-1,@#TEMP1     ;-1
002364 012737 000020 000436        MOV  #16.,@#TEMP2    ;SHIFTED BY 15.
002372 005037 000440               CLR  @#TEMP3         ;IS=0
002376 012737 000007 000442        MOV  #7,@#TEMP4      ;AND PS=7
002404 000207                      RTS  PC
002406 021527 000047        TST47: CMP  (R5),#47        ;IS IT TEST 47?
002412 001011                      BNE  TST50           ;IF NOT THEN TRY TEST 50
002414 005337 000436               DEC  @#TEMP2         ;-1 SHIFTED BY 15
002420 012737 100000 000440        MOV  #100000,@#TEMP3 ;IS=100000
002426 012737 000011 000442        MOV  #11,@#TEMP4     ;AND PS=11
```

```
                                                RTS     PC
002434  000207                          TST50:  CMP     (R5),#50        ;IS IT TEST 50
002436  021527  000050                  ENTS1:  BNE     ENTS1           ;IF NOT THEN TRY TEST 51
002442  001007                          MOV     #137777,@#TEMP1 ;137777 SHIFTED BY 15. IS=100000
002444  012737  137777  000434          MOV     #13,@#TEMP4     ;AND PS=13
002452  012737  000013  000442          RTS     PC
002460  000207                          CMP     (R5),#51        ;IS IT ENTERING TEST 51?
002462  021527  000051                  BEQ     .+10
002466  001403                          JSP     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
002470  004767  013744                  ;TEST NUMBER GOOFED
002474  000015                          15
002476  005726                          TST     (SP)+           ;RESTORE STACK POINTER
002500  012704  177771                  MOV     #-7,%4
002504  012702  000454                  MOV     #51,%2
002510  012703  000456                  MOV     #52,%3
```

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

002514  010701                  TST51:  SCOPE1
002516  012701  125252                  MOV     #125252,%1      ;LOAD R1 WITH 125252
002522  072127  000005                  ASH     #5,%1           ;SHIFT R1 BY #5
002526  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
002532  122737  000003  000432          CMPB    #3,@#PSWORD     ;IS THE PS 3?
002540  001403                          BEQ     .+10
002542  004767  013672                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 3
002546  000016                          16
002550  027701  052500                  CMP     #52500,%1       ;IS THE RESULT 52500?
002554  001403                          BEQ     .+10
002556                          1$:
002556  004767  013656                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;R1 IS NOT EQUAL TO 52500 OR INCORRECT SEQUENCE
002562  000017                          17
002564  021527  000051                  CMP     (R5),#51                ;IS $TESTN = #5?
002570  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
002572  005215                          INC     (R5)



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

002574  010701                  TST52:  SCOPE1
002576  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
002602  072077  175650                  ASH     @52,%0          ;SHIFT R0 BY @52
002606  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
002612  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS THE PS 10?
002620  001403                          BEQ     .+10
002622  004767  013612                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 10
002626  000020                          20
002630  027700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
002634  001403                          BEQ     .+10
002636                          1$:
002636  004767  013576                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
002642  000021                          21
002644  021527  000052                  CMP     (R5),#52                ;IS $TESTN = #52
002650  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
002652  005215                          INC     (R5)
```

```
DF*ACA  MACY11 30.1046)  04-AUG-77  14:09  PAGE 20
DF*ACA.SRC     18-NOV-75 00:00           ASH INSTRUCTION TESTS

                                         ;*****************************************************************
                                         ;TEST:53   11/34   ASH     125252 SHIFTED BY @#51 = 177525  PS = 1C
                                         ;*****************************************************************

002654  010701                           TST53:  SCOPE1
002656  012700  125252                           MOV     #125252,%0      ;LOAD R0 WITH 125252
002662  072037  000454                           ASH     @#51,%0         ;SHIFT R0 BY @#51
002666  106737  000432                           MFPS    @#PSWORD        ;SAVE PS
002672  122737  000010  000432                   CMPB    #10,@#PSWORD    ;IS THE PS 10?
002700  001403                                   BEQ     .+10
002702  004767  013532                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                         ;THE PS IS NOT EQUAL TO 1C
002706  000022                                   22
002710  022700  177525                           CMP     #177525,%0      ;IS THE RESULT 177525?
002714  001403                                   BEQ     .+10
002716                                   1$:
002716  004767  013516                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                         ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
002722  000023                                   23
002724  021527  000053                           CMP     (R5),#53                ;IS $TESTN = #53
002730  001372                                   BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
002732  005215                                   INC     (R5)



                                         ;*****************************************************************
                                         ;TEST:54   11/34   ASH     125252 SHIFTED BY (2) = 177525  PS = 1C
                                         ;*****************************************************************

002734  010701                           TST54:  SCOPE1
002736  012700  125252                           MOV     #125252,%0      ;LOAD R0 WITH 125252
002742  072012                                   ASH     (2),%0          ;SHIFT R0 BY (2)
002744  106737  000432                           MFPS    @#PSWORD        ;SAVE PS
002750  122737  000010  000432                   CMPB    #10,@#PSWORD    ;IS THE PS 10?
002756  001403                                   BEQ     .+10
002760  004767  013454                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                         ;THE PS IS NOT EQUAL TO 1C
002764  000024                                   24
002766  022700  177525                           CMP     #177525,%0      ;IS THE RESULT 177525?
002772  001403                                   BEQ     .+10
002774                                   1$:
002774  004767  013440                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                         ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
003000  000025                                   25
003002  021527  000054                           CMP     (R5),#54                ;IS $TESTN = #54
003006  001372                                   BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003010  005215                                   INC     (R5)
```

```
                                        ;*****************************************************************
                                        ;TEST:55   11/34   ASH     125252 SHIFTED BY (2)+ = 177525  PS = 1C
                                        ;*****************************************************************

003012  010701                  TST55:  SCOPE1
003014  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
003020  072022                          ASH     (2)+,%0         ;SHIFT R0 BY (2)+
003022  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
003026  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS THE PS 10?
003034  001403                          BEQ     .+10
003036  004767  013376                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 1C
003042  000026                          26
003044  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
003050  001403                          BEQ     .+10
003052                          1$:
003052  004767  013362                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
003056  000027                          27
003060  021527  000055                  CMP     (R5),#55                ;IS $TESTN = #55
003064  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003066  005215                          INC     (R5)



                                        ;*****************************************************************
                                        ;TEST:56   11/34   ASH     125252 SHIFTED BY -(2) = 177525  PS = 1C
                                        ;*****************************************************************

003070  010701                  TST56:  SCOPE1
003072  012700  125252                  MOV     #125252,%0      ;LOAD R0 WITH 125252
003076  072042                          ASH     -(2),%0         ;SHIFT R0 BY -(2)
003100  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
003104  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS THE PS 10?
003112  001403                          BEQ     .+10
003114  004767  013320                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 1C
003120  000030                          30
003122  022700  177525                  CMP     #177525,%0      ;IS THE RESULT 177525?
003126  001403                          BEQ     .+10
003130                          1$:
003130  004767  013304                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
003134  000031                          31
003136  021527  000056                  CMP     (R5),#56                ;IS $TESTN = #56
003142  001372                          BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003144  005215                          INC     (R5)
```

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

003146  010701          TST57:  SCOPE1
003150  012700  125252          MOV     #125252,%0      ;LOAD R0 WITH 125252
003154  072063  000002          ASH     2(3),%0         ;SHIFT R0 BY 2(3)
003160  106737  000432          MFPS    @#PSWORD        ;SAVE PS
003164  122737  000011  000432  CMPB    #11,@#PSWORD    ;IS THE PS 11?
003172  001403                  BEQ     .+10
003174  004767  013240          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 11
003200  000032                  32
003202  022700  177252          CMP     #177252,%0      ;IS THE RESULT 177252?
003206  001403                  BEQ     .+10
003210                  1$:
003210  004767  013224          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177252 OR INCORRECT SEQUENCE
003214  000033                  33
003216  021527  000057          CMP     (R5),#57                ;IS $TESTN = #57
003222  001372                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003224  005215                  INC     (R5)


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

003226  010701          TST60:  SCOPE1
003230  012700  125252          MOV     #125252,%0      ;LOAD R0 WITH 125252
003234  072073  000000          ASH     @(3),%0         ;SHIFT R0 BY @(3)
003240  106737  000432          MFPS    @#PSWORD        ;SAVE PS
003244  122737  000010  000432  CMPB    #10,@#PSWORD    ;IS THE PS 10?
003252  001403                  BEQ     .+10
003254  004767  013160          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10
003260  000034                  34
003262  022700  177525          CMP     #177525,%0      ;IS THE RESULT 177525?
003266  001403                  BEQ     .+10
003270                  1$:
003270  004767  013144          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
003274  000035                  35
003276  021527  000060          CMP     (R5),#60                ;IS $TESTN = #60
003302  001372                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003304  005215                  INC     (R5)
```

```
CF.ACA  MACY11 30.1046)  04-AUG-77  14:09  PAGE 23
CF.ACA.SRC    18-NOV-75 00:00          ASH INSTRUCTION TESTS

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

003306  010701                         TST61:  SCOPE1
003310  012700  125252                         MOV     #125252,%0      ;LOAD R0 WITH 125252
003314  072033                         ASH     @(3)+,%0        ;SHIFT R0 BY @(3)+
003316  106737  000432                 MFPS    @#PSWORD        ;SAVE PS
003322  122737  000010  000432         CMPB    #10,@#PSWORD    ;IS THE PS 10?
003330  001403                         BEQ     .+10
003332  004767  013102                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;THE PS IS NOT EQUAL TO 10
003336  000036                         36
003340  022700  177525                 CMP     #177525,%0      ;IS THE RESULT 177525?
003344  001403                         BEQ     .+10
003346                           1$:
003346  004767  013066                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
003352  000037                         37
003354  021527  000061                 CMP     (R5),#61                ;IS $TESTN = #61
003360  001372                         BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003362  005215                         INC     (R5)


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

003364  010701                         TST62:  SCOPE1
003366  012700  125252                         MOV     #125252,%0      ;LOAD R0 WITH 125252
003372  072053                         ASH     @-(3),%0        ;SHIFT R0 BY @-(3)
003374  106737  000432                 MFPS    @#PSWORD        ;SAVE PS
003400  122737  000010  000432         CMPB    #10,@#PSWORD    ;IS THE PS 10?
003406  001403                         BEQ     .+10
003410  004767  013024                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;THE PS IS NOT EQUAL TO 10
003414  000040                         40
003416  022700  177525                 CMP     #177525,%0      ;IS THE RESULT 177525?
003422  001403                         BEQ     .+10
003424                           1$:
003424  004767  013010                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;R0 IS NOT EQUAL TO 177525 OR INCORRECT SEQUENCE
003430  000041                         41
003432  021527  000062                 CMP     (R5),#62                ;IS $TESTN = #62
003436  001372                         BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
003440  005215                         INC     (R5)
```

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



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

003442  012737  000062  000430         MOV     #62,@#COUNT
003450  005037  000434                 CLR     @#TEMP1         ;TEMP1=0
003454  012737  000001  000436         MOV     #1,@#TEMP2      ;TEMP2=1
003462  005037  000440                 CLR     @#TEMP3         ;TEMP3=0
003466  005037  000442                 CLR     @#TEMP4         ;TEMP4=0
003472  012737  000001  000444         MOV     #1,@#TEMP5      ;TEMP5=1
003500  005037  000446                 CLR     @#TEMP6         ;0 1 SHIFTED BY 0=0 1, PS=0

003504  010703                 REG01:  SCOPE3
003506  010502                         MOV     R5,R2           ;SAVE R5
003510  013700  000434                 MOV     @#TEMP1,%0      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 0
003514  013701  000436                 MOV     @#TEMP2,%0+1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 1
003520  000241                         CLC
003522  032737  000001  000406         BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
003530  001004                         BNE     2$              ;IF NOT THEN GO TO 2$
003532  013705  000440                 MOV     @#TEMP3,R5      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
003536  073005                         ASHC    R5,R0           ;USING R0
003540  000402                         BR      4$
003542  073067  174672         2$:     ASHC    TEMP3,%0        ;ASHC REGISTER 0 BY THE CONTENTS OF TEMP3
003546  106737  000432         4$:     MFPS    @#PSWORD        ;SAVE PS
003552  123737  000446  000432         CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
003560  001403                         BEQ     .+10
003562  004767  012652                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;WRONG PS
003566  000042                         42
003570  005237  000430                 INC     @#COUNT
003574  023700  000442                 CMP     @#TEMP4,%0      ;IS THE RESULT IN R0 SAME AS TEMP4?
003600  001403                         BEQ     .+10
003602  004767  012632                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;WRONG RESULT IN R0
003606  000043                         43
003610  023701  000444                 CMP     @#TEMP5,%1      ;IS THE RESULT IN R1 SAME AS TEMP5?
003614  001403                         BEQ     .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
                                                               ;AND PS=TEMP6
003616  004767  012616                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;WRONG RESULT IN R1
003622  000044                         44
003624  010205                         MOV     R2,R5           ;RESTORE R5
003626  021537  000430                 CMP     (R5),@#COUNT    ;IS TEST NUMBER=COUNTER?
003632  001403                         BEQ     .+10
003634  004767  012600                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;NO
003640  000045                         45
003642  005215                         INC     (R5)
```

```
 1102  003644  021527  000160                    CMP     (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
 1103  003650  002014                            BGE     6$              ;YES
 1104  003652  005237  000440                    INC     @#TEMP3
 1105  003656  000241                            CLC
 1106  003660  006137  000444                    ROL     @#TEMP5         ;ROTATE TEMP5 LEFT BY 1 PLACE
 1107  003664  006137  000442                    ROL     @#TEMP4         ;INTRODUCE CARRY FROM TEMP4 IN TEMP5
 1108  003670  021527  000121                    CMP     (R5),#121       ;IS IT TEST 121?
 1109  003674  001004                            BNE     REG23
 1110  003676  004467  000410                    JSR     R4,RITSH        ;IF SO THEN GO AND INITIATE RIGHT SHIFT
 1111  003702  004767  000440            6$:     JSR     %7,TST160
 1112  003706  010701                    REG23:  SCOPE1
 1113  003710  013702  000434                    MOV     @#TEMP1,%2      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 2
 1114  003714  013703  000436                    MOV     @#TEMP2,%2+1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 3
 1115  003720  000241                            CLC
 1116  003722  032737  000001  000406            BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
 1117  003730  001004                            BNE     2$              ;IF NOT THEN GO TO 2$
 1118  003732  013704  000440                    MOV     @#TEMP3,R4      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 0
 1119  003736  073204                            ASHC    R4,R2           ;USING R2
 1120  003740  000402                            BR      4$
 1121  003742  073267  174472            2$:     ASHC    TEMP3,%2        ;ASHC REGISTER 2 BY THE CONTETNS OF TEMP3
 1122  003746  106737  000432            4$:     MFPS    @#PSWORD        ;SAVE PS
 1123  003752  123737  000446  000432            CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
 1124  003760  001403                            BEQ     .+10
 1125  003762  004767  012452                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 1126                                                                    ;WRONG PS
 1127  003766  000046                            46
 1128  003770  005237  000430                    INC     @#COUNT
 1129  003774  023702  000442                    CMP     @#TEMP4,%2      ;IS THE RESULT IN R2 SAME AS TEMP4?
 1130  004000  001403                            BEQ     .+10
 1131  004002  004767  012432                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 1132                                                                    ;WRONG RESULT IN R2
 1133  004006  000047                            47
 1134  004010  023703  000444                    CMP     @#TEMP5,%3      ;IS THE RESULT IN R3 SAME AS TEMP5?
 1135  004014  001403                            BEQ     .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
 1136                                                                    ;AND PS=TEMP6
 1137  004016  004767  012416                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 1138                                                                    ;WRONG RESULT IN R1
 1139  004022  000050                            50
 1140  004024  021537  000430                    CMP     (R5),@#COUNT    ;IS TEST NUMBER=COUNTER?
 1141  004030  001403                            BEQ     .+10
 1142  004032  004767  012402                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 1143                                                                    ;NO
 1144  004036  000051                            51
 1145  004040  005215                            INC     (R5)
 1146  004042  021527  000160                    CMP     (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
 1147  004046  002014                            BGE     6$              ;YES
 1148  004050  005237  000440                    INC     @#TEMP3
 1149  004054  000241                            CLC
 1150  004056  006137  000444                    ROL     @#TEMP5         ;ROTATE TEMP5 LEFT BY 1 PLACE
 1151  004062  006137  000442                    ROL     @#TEMP4         ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
 1152  004066  021527  000121                    CMP     (R5),#121       ;IS IT TEST 121?
 1153  004072  001004                            BNE     REG45
 1154  004074  004467  000212                    JSR     R4,RITSH        ;IF SO THEN GO AND INITIATE RIGHT SHIFT
 1155  004100  004767  000242            6$:     JSR     %7,TST160
 1156  004104  010701                    REG45:  SCOPE1
 1157  004106  010501                            MOV     R5,R1           ;SAVE R5
```

```
1158  004110  013704  000434                  MOV     @#TEMP1,%4      ;PLACE THE CONTENTS OF TEMP1 IN REGISTER 4
1159  004114  013705  000436                  MOV     @#TEMP2,%4+1    ;PLACE THE CONTENTS OF TEMP2 IN REGISTER 5
1160  004120  000241                          CLC
1161  004122  032737  000001  000406          BIT     #1,@#$PASS      ;IS IT AN EVEN PASS ?
1162  004130  001004                          BNE     2$              ;IF NOT THEN GO TO 2$
1163  004132  013700  000440                  MOV     @#TEMP3,R0      ;OTHERWISE EXECUTE ASHC INSTRUCTION IN MODE 2
1164  004136  073400                          ASHC    R0,R4           ;USING R4
1165  004140  000402                          BR      4$
1166  004142  073467  174272          2$:     ASHC    TEMP3,%4        ;ASHC REGISTER 4 BY THE CONTENTS OF TEMP3
1167  004146  106737  000432          4$:     MFPS    @#PSWORD        ;SAVE PS
1168  004152  123737  000446  000432          CMPB    @#TEMP6,@#PSWORD;COMPARE PS WITH THE CONTENTS OF TEMP6
1169  004160  001403                          BEQ     .+10
1170  004162  004767  012252                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1171                                                                  ;WRONG PS
1172  004166  000052                          52
1173  004170  005237  00043C                  INC     @#COUNT
1174  004174  023704  000442                  CMP     @#TEMP4,%4      ;IS THE RESULT IN R4 SAME AS TEMP4?
1175  004200  001403                          BEQ     .+10
1176  004202  004767  012232                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1177                                                                  ;WRONG RESULT IN R4
1178  004206  000053                          53
1179  004210  023705  000444                  CMP     @#TEMP5,%5      ;IS THE RESULT IN R5 SAME AS TEMP5?
1180  004214  001403                          BEQ     .+10            ;TEMP1 TEMP2 SHIFTED BY TEMP3=TEMP4 TEMP5
1181                                                                  ;AND PS=TEMP6
1182  004216  004767  012216                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1183                                                                  ;WRONG RESULT IN R5
1184  004222  000054                          54
1185  004224  021137  000430                  CMP     (R1),@#COUNT    ;IS TEST NUMBER=COUNTER?
1186  004230  001403                          BEQ     .+10
1187  004232  004767  012202                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1188                                                                  ;NO
1189  004236  000055                          55
1190  004240  010105                          MOV     R1,R5           ;RESTORE R5
1191  004242  005215                          INC     (R5)
1192  004244  021527  000160                  CMP     (R5),#160       ;HAVE THE FIRST 159 TEST BEEN EXECUTED?
1193  004250  002014                          BGE     6$              ;YES
1194  004252  005237  000440                  INC     @#TEMP3
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 27
DFKACA.SAC    18-NOV-75 00:00          ASHC INSTRUCTION TESTS

 195  004256  000241                          CLC
 196  004260  006137  000444                  ROL     @#TEMP5         ;ROTATE TEMPS LEFT BY 1 PLACE
 197  004264  006137  000442                  ROL     @#TEMP4         ;INTRODUCE CARRY FROM TEMP5 IN TEMP4
 198  004270  021527  000121                  CMP     (R5),#121       ;IS IT TEST 121?
 199  004274  001004                          BNE     B$
 200  004276  004467  000010                  JSR     R4,RITSH        ;IF SO THEN GO AND INITIATE RIGHT SHIFT
 201  004302  004767  000040          6$:     JSR     %7,TST160
 202  004306  000167  177172          B$:     JMP     REGO1
 203  004312  022424                  RITSH:  CMP     (R4)+,(R4)+     ;MAKE R4 POINT TO THE NEXT REG TAG
 204  004314  012737  040000  000434          MOV     #40000,@#TEMP1  ;TEMP1=4000
 205  004322  005037  000436                  CLR     @#TEMP2         ;TEMP2=0
 206  004326  012737  177742  000440          MOV     #-30.,@#TEMP3   ;TEMP3=-30
 207  004334  005037  000442                  CLR     @#TEMP4         ;TEMP4=0
 208  004340  005237  000444                  INC     @#TEMP5         ;TEMP5=1
 209  004344  000204                          RTS     R4
 210  004346  021527  000160          TST160: CMP     (R5),#160       ;IS IT TEST 160
 211  004352  001010                          BNE     TST161          ;IF NOT THEN TRY TEST 161
 212  004354  005037  000434                  CLR     @#TEMP1         ;0 0 SHIFTED BY 0
 213  004360  005037  000442                  CLR     @#TEMP4         ;IS EQUAL TO 0 0
 214  004364  012737  000004  000446          MOV     #4,@#TEMP6      ;AND PS=4
 215  004372  000207                          RTS     %7
 216  004374  021527  000161          TST161: CMP     (R5),#161       ;IS IT TEST 161
 217  004400  001004                          BNE     TST162
 218  004402  012737  177746  000440          MOV     #-32,@#TEMP3    ;0 0 SHIFTED BY -32=0 0, PS=4
 219  004410  000207                          RTS     %7
 220  004412  021527  000162          TST162: CMP     (R5),#162       ;IS IT TEST 162
 221  004416  001004                          BNE     TST163          ;IF NOT THEN TRY TEST 163
 222  004420  012737  000032  000440          MOV     #32,@#TEMP3     ;0 0 SHIFTED BY 32=0 0, PS=4
 223  004426  000207                          RTS     %7
 224  004430  021527  000163          TST163: CMP     (R5),#163       ;IS IT TEST 163?
 225  004434  001016                          BNE     TST164          ;IF NOT THEN TRY TEST 164
 226  004436  012737  052525  000434          MOV     #52525,@#TEMP1  ;52525 0
 227  004444  012737  177760  000440          MOV     #-16.,@#TEMP3   ;SHIFTED BY -16.
 228  004452  005037  000442                  CLR     @#TEMP4
 229  004456  012737  052525  000444          MOV     #52525,@#TEMP5  ;IS EQUAL TO 0 52525
 230  004464  005037  000446                  CLR     @#TEMP6         ;AND PS = 0
 231  004470  000207                          RTS     %7
 232  004472  021527  000164          TST164: CMP     (R5),#164       ;IS IT TEST 164?
 233  004476  001014                          BNE     TST165          ;IF NOT THEN TRY TEST 165
 234  004500  012737  125252  000434          MOV     #125252,@#TEMP1 ;125252 0 SHIFTED BY -16.
 235  004506  005337  000442                  DEC     @#TEMP4
 236  004512  012737  125252  000444          MOV     #125252,@#TEMP5 ;IS EQUAL TO -1 125252
 237  004520  012737  000010  000446          MOV     #10,@#TEMP6     ;AND PS=10
 238  004526  000207                          RTS     %7
 239  004530  021527  000165          TST165: CMP     (R5),#165       ;IS IT TEST 165?
 240  004534  001007                          BNE     TST166          ;IF NOT THEN TRY TEST 166
 241  004536  012737  177777  000434          MOV     #-1,@#TEMP1     ;-1 0 SHIFTED BY -16
 242  004544  012737  177777  000444          MOV     #-1,@#TEMP5     ;IS EQUAL TO -1 -1, AND PS=10
 243  004552  000207                          RTS     %7
 244  004554  021527  000166          TST166: CMP     (R5),#166       ;IS IT TEST 166?
 245  004560  001011                          BNE     TST167          ;IF NOT THEN TRY TEST 167
 246  004562  012737  100000  000434          MOV     #100000,@#TEMP1 ;100000 0
 247  004570  012737  177740  000440          MOV     #-32.,@#TEMP3   ;SHIFTED BY -32 IS EQUAL TO -1 -1
 248  004576  005237  000446                  INC     @#TEMP6         ;AND PS=11
 249  004602  000207                          RTS     %7
 250  004604  021527  000167          TST167: CMP     (R5),#167       ;IS IT TEST 167?
```

```
;25:  004610  001014                        BNE     TST170          ;IF NOT THEN TRY TEST 170
;252  004612  005037  000434                CLR     @#TEMP1
;253  004616  005337  000436                DEC     @#TEMP2         ;0 -1
;254  004622  012737  000020  000440        MOV     #16.,@#TEMP3    ;SHIFTED BY 16.
;255  004630  005037  000444                CLR     @#TEMP5         ;IS EQUAL TO -1 0
;256  004634  005237  000446                INC     @#TEMP6         ;AND PS=12
;257  004640  000207                        RTS     %7
;258  004642  021527  000170        TST170: CMP     (R5),#170       ;IS IT TEST 170?
;259  004646  001007                        BNE     TST171          ;IF NOT THEN TRY TEST 171
;260  004650  012737  125252  000436        MOV     #125252,@#TEMP2 ;0 125252 SHIFTED BY 16
;261  004656  012737  125252  000442        MOV     #125252,@#TEMP4 ;IS EQUAL TO 125252 0, AND PS=12
;262  004664  000207                        RTS     %7
;263  004666  021527  000171        TST171: CMP     (R5),#171       ;IS IT TEST 171?
;264  004672  001010                        BNE     TST172          ;IF NOT THEN TRY TEST 172
;265  004674  005337  000440                DEC     @#TEMP3         ;0 125252 SHIFTED BY 15
;266  004700  012737  052525  000442        MOV     #52525,@#TEMP4  ;IS EQUAL TO 52525 0
;267  004706  005037  000446                CLR     @#TEMP6         ;AND PS=0
;268  004712  000207                        RTS     %7
;269  004714  021527  000172        TST172: CMP     (R5),#172       ;IS IT TEST 172?
;270  004720  001006                        BNE     TST173          ;IF NOT THEN TRY TEST 173
;271  004722  012737  052525  000436        MOV     #52525,@#TEMP2  ;0 52525
;272  004730  005237  000440                INC     @#TEMP3         ;SHIFTED BY 16. IS EQUAL TO 52525 0. AND PS=0
;273  004734  000207                        RTS     %7
;274  004736  021527  000173        TST173: CMP     (R5),#173       ;IS IT TEST 173?
;275  004742  001014                        BNE     TST174          ;IF NOT THEN TRY TEST 174
;276  004744  012737  177777  000436        MOV     #-1,@#TEMP2     ;0 -1
;277  004752  005337  000440                DEC     @#TEMP3         ;SHIFTED BY 15.
;278  004756  012737  077777  000442        MOV     #77777,@#TEMP4
;279  004764  012737  100000  000444        MOV     #100000,@#TEMP5 ;IS EQUAL TO 77777 100000, AND PS=0
;280  004772  000207                        RTS     %7
;281  004774  021527  000174        TST174: CMP     (R5),#174       ;IS IT TEST 174?
;282  005000  001013                        BNE     TST175          ;IF NOT THEN TRY TEST 175
;283  005002  012737  100000  000434        MOV     #100000,@#TEMP1
;284  005010  005337  000436                DEC     @#TEMP2         ;100000 -2 SHIFTED BY 15.
;285  005014  005037  000444                CLR     @#TEMP5         ;IS EQUAL TO 77777 0
;286  005020  012737  000002  000446        MOV     #2,@#TEMP6      ;AND PS=2
;287  005026  000207                        RTS     %7
;288  005030  021527  000175        TST175: CMP     (R5),#175       ;IS IT TEST 175?
;289  005034  001015                        BNE     ENT176          ;IF NOT THEN TRY TEST 176
;290  005036  012737  177777  000434        MOV     #-1,@#TEMP1
;291  005044  005037  000436                CLR     @#TEMP2         ;-1 0
;292  005050  005237  000440                INC     @#TEMP3         ;SHIFTED BY 16.
;293  005054  005037  000442                CLR     @#TEMP4         ;IS EQUAL TO 0 0
;294  005060  012737  000007  000446        MOV     #7,@#TEMP6      ;AND PS=7
;295  005066  000207                        RTS     %7
;296  005070  021527  000176        ENT176: CMP     (R5),#176       ;IS THE PROGRM ENTERING TEST 176?
;297  005074  001403                        BEQ     .+10
;298  005076  004767  011336                JSR     PC,$HLT         ;SEEN AN ERROR, GO TO THE HALT ROUTINE
;                                                                  ;TEST NUMBER GOOFED
;      005102  000066                        56
;
;      005104  005726                        TST     (SP)+           ;RESTORE STACK POINTER
;
```

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

005106  010701                  TST176: SCOPE1
005110  012701  000000                  MOV     #DUMMY,%1       ;LOAD R1 WITH DUMMY
005114  012701  000001                  MOV     #1,%1!1         ;LOAD R1!1 WITH 1
005120  000241                          CLC
005122  073127  000010                  ASHC    #8.,%1          ;SHIFT R1,R1!1 BY 8.
005126  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
005132  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS THE PS 0?
005140  001403                          BEQ     .+10
005142  004767  011272                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 0
005146  000057                          57
005150  022701  000400                  CMP     #400,%1         ;IS THE RESULT 400?
005154  001403                          BEQ     .+10
005156  004767  011256                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;R1 IS NOT EQUAL TO 400
005162  000060                          60
005164  021527  000176                  CMP     (R5),#176               ;IS $TESTN = #176?
005170  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
005172  004767  011242                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
005176  000061                          61
005200  005215                          INC     (R5)


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

005202  010701                  TST177: SCOPE1
005204  012703  000000                  MOV     #DUMMY,%3       ;LOAD R3 WITH DUMMY
005210  012703  177777                  MOV     #-1,%3!1        ;LOAD R3!1 WITH -1
005214  000241                          CLC
005216  073327  000017                  ASHC    #15.,%3         ;SHIFT R3,R3!1 BY 15.
005222  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
005226  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS THE PS 11?
005234  001403                          BEQ     .+10
005236  004767  011176                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;THE PS IS NOT EQUAL TO 11
005242  000062                          62
005244  022703  100000                  CMP     #100000,%3      ;IS THE RESULT 100000?
005250  001403                          BEQ     .+10
005252  004767  011162                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;R3 IS NOT EQUAL TO 100000
005256  000063                          63
005260  021527  000177                  CMP     (R5),#177               ;IS $TESTN = #177?
005264  001403                          BEQ     .+10            ;IF NOT THEN GO TO HLT
005266  004767  011136                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
005272  000064                          64
005274  005215                          INC     (R5)
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 30
DFKACA.SRC    18-NOV-75 00:00          ASHC INSTRUCTION TESTS

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

005276  010701                         TST200: SCOPE1
005300  010501                                 MOV     R5,R1           ;SAVE R5
005302  012705  000000                         MOV     #DUMMY,%5       ;LOAD R5 WITH DUMMY
005306  012705  052525                         MOV     #52525,%5!1     ;LOAD R5!1 WITH 52525
005312  000241                               CLC
005314  073527  000000                       ASHC    #0,%5           ;SHIFT R5,R5!1 BY 0
005320  106737  000432                       MFPS    @#PSWORD        ;SAVE PS
005324  122737  000000  000432               CMPB    #0,@#PSWORD     ;IS THE PS 0?
005332  001403                               BEQ     .+10
005334  004767  011100                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;THE PS IS NOT EQUAL TO 0

005340  000065                               65
005342  022705  052525                       CMP     #52525,%5       ;IS THE RESULT 52525?
005346  001403                               BEQ     .+10
005350  004767  011064                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R5 IS NOT EQUAL TO 52525

005354  000066                               66
005356  010105                               MOV     R1,R5           ;RESTORE R5
005360  021527  000200                       CMP     (R5),#200               ;IS $TESTN = #200?
005364  001403                               BEQ     .+10            ;IF NOT THEN GO TO HLT
005366  004767  011046                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;TEST IS IN WRONG SEQUENCE

005372  000067                               67
005374  005215                               INC     (R5)


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

005376  010701                         TST201: SCOPE1
005400  012701  000000                         MOV     #DUMMY,%1       ;LOAD R1 WITH DUMMY
005404  012701  020010                         MOV     #20010,%1!1     ;LOAD R1!1 WITH 20010
005410  000241                               CLC
005412  073127  177763                       ASHC    #-13.,%1        ;SHIFT R1,R1!1 BY -13.
005416  106737  000432                       MFPS    @#PSWORD        ;SAVE PS
005422  122737  000000  000432               CMPB    #0,@#PSWORD     ;IS THE PS 0?
005430  001403                               BEQ     .+10
005432  004767  011002                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;THE PS IS NOT EQUAL TO 0

005436  000070                               70
005440  022701  000101                       CMP     #101,%1         ;IS THE RESULT 101?
005444  001403                               BEQ     .+10
005446  004767  010766                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R1 IS NOT EQUAL TO 101

005452  000071                               71
005454  021527  000201                       CMP     (R5),#201               ;IS $TESTN = #201?
005460  001403                               BEQ     .+10            ;IF NOT THEN GO TO HLT
005462  004767  010752                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;TEST IS IN WRONG SEQUENCE

005466  000072                               72
005470  005215                               INC     R5,
```

```
CFMACA  MACY11 30.(1046)  04-AUG-77  14:09  PAGE 32
CFMACA.SRC    18-NOV-75 00:0C          ASHC INSTRUCTION TESTS


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

005472  010701                         TST202: SCOPE1
005474  012703  000000                         MOV     #DUMMY,%3       ;LOAD R3 WITH DUMMY
005500  012703  177777                         MOV     #-1,%3!1        ;LOAD R3!1 WITH -1
005504  000241                               CLC
005506  073327  000020                         ASHC    #16.,%3         ;SHIFT R3,R3!1 BY 16.
005512  106737  000432                         MFPS    @#PSWORD        ;SAVE PS
005516  122737  000011  000432               CMPB    #11,@#PSWORD    ;IS THE PS 11?
005524  001403                               BEQ     .+10
005526  004767  010706                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;THE PS IS NOT EQUAL TO 11

005532  000073                               73
005534  022703  000000                       CMP     #0,%3           ;IS THE RESULT 0?
005540  001403                               BEQ     .+10
005542  004767  010672                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R3 IS NOT EQUAL TO 0

005546  000074                               74
005550  021527  000202                       CMP     (R5),#202               ;IS $TESTN = #202?
005554  001403                               BEQ     .+10            ;IF NOT THEN GO TO HLT
005556  004767  010656                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;TEST IS IN WRONG SEQUENCE

005562  000075                               75
005564  005215                               INC     (R5)


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

005566  010701                         TST203: SCOPE1
005570  010501                               MOV     R5,R1           ;SAVE R5
005572  012705  000000                       MOV     #DUMMY,%5       ;LOAD R5 WITH DUMMY
005576  012705  000001                       MOV     #1,%5!1         ;LOAD R5!1 WITH 1
005602  000241                               CLC
005604  073527  177777                       ASHC    #-1,%5          ;SHIFT R5,R5!1 BY -1
005610  106737  000432                       MFPS    @#PSWORD        ;SAVE PS
005614  122737  000001  000432               CMPB    #1,@#PSWORD     ;IS THE PS 1?
005622  001403                               BEQ     .+10
005624  004767  010610                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;THE PS IS NOT EQUAL TO 1

005630  000076                               76
005632  022705  100000                       CMP     #100000,%5      ;IS THE RESULT 100000?
005636  001403                               BEQ     .+10
005640  004767  010574                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R5 IS NOT EQUAL TO 100000

005644  000077                               77
005646  012105                               MOV     R1,R5           ;RESTORE R5
005650  021527  000203                       CMP     (R5),#203               ;IS $TESTN = #203?
005654  001403                               BEQ     .+10            ;IF NOT THEN GO TO HLT
005656  004767  010556                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;TEST IS IN WRONG SEQUENCE

005662  000100                               100
005664  005215                               INC     R5
```

1474
1475

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

005666  010701                          TST204: SCOPE1
005670  012701  000000                          MOV     #DUMMY,%1       ;LOAD R1 WITH DUMMY
005674  012701  125252                          MOV     #125252,%1!1    ;LOAD R1!1 WITH 125252
005700  000241                                  CLC
005702  073127  177760                          ASHC    #-16.,%1        ;SHIFT R1,R1!1 BY -16.
005706  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
005712  122737  000011  000432                  CMPB    #11,@#PSWORD    ;IS THE PS 11?
005720  001403                                  BEQ     .+10
005722  004767  010512                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
005726  000101                                  101
005730  022701  125252                          CMP     #125252,%1      ;IS THE RESULT 125252?
005734  001403                                  BEQ     .+10
005736  004767  010476                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R1 IS NOT EQUAL TO 125252
005742  000102                                  102
005744  021527  000204                          CMP     (R5),#204               ;IS $TESTN = #204?
005750  001403                                  BEQ     .+10            ;IF NOT THEN GO TO HLT
005752  004767  010462                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
005756  000103                                  103
005760  005215                                  INC     (R5)


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

005762  010701                          TST205: SCOPE1
005764  012702  125252                          MOV     #125252,%2      ;LOAD R2 WITH 125252
005770  012703  125252                          MOV     #125252,%2!1    ;LOAD R2!1 WITH 125252
005774  000241                                  CLC
005776  073227  000025                          ASHC    #21.,%2         ;SHIFT R2,R2!1 BY 21.
006002  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
006006  122737  000003  000432                  CMPB    #3,@#PSWORD     ;IS THE PS 3?
006014  001403                                  BEQ     .+10
006016  004767  010416                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 3
006022  000104                                  104
006024  022702  052500                          CMP     #52500,%2       ;IS THE RESULT 52500?
006030  001403                                  BEQ     .+10
006032  004767  010402                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R2 IS NOT EQUAL TO 52500
006036  000105                                  105
006040  022703  000000                          CMP     #000000,%2!1    ;IS THE RESULT 000000?
006044  001403                                  BEQ     .+10
006046  004767  010366                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R2!1 IS NOT EQUAL TO 000000
006052  000106                                  106
006054  021527  000205                          CMP     (R5),#205               ;IS $TESTN = #205?
006060  001403                                  BEQ     .+10            ;IF NOT THEN GO TO HLT
006062  004767  010352                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
```

```
                                                            ;TEST IS IN WRONG SEQUENCE
006066  000107                          107
006070  005215                          INC     (R5)



006072  012702  177771                  MOV     #-7,%2
006076  012703  000454                  MOV     #S1,%3
006102  012704  000456                  MOV     #S2,%4

```

```
DFKAOA  MACY11 38(1046)  04-AUG-77  14:09  PAGE 36
DFKAOA.SRC    18-NOV-75 00:00          ASHC INSTRUCTION TESTS

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

006106  010701                         TST206: SCOPE1
006110  012700  125252                         MOV     #125252,%0              ;LOAD R0 WITH 125252
006114  012701  125252                         MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
006120  000241                         CLC
006122  073067  172326                 ASHC    S1,%0           ;SHIFT R0,R0!1 BY S1
006126  106737  000432                 MFPS    @#PSWORD        ;SAVE PS
006132  122737  000010  000432         CMPB    #10,@#PSWORD    ;IS THE PS 10?
006140  001403                         BEQ     .+10
006142  004767  010272                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;THE PS IS NOT EQUAL TO 10
006146  000110                         110
006150  022700  177525                 CMP     #177525,%0      ;IS THE RESULT 177525?
006154  001403                         BEQ     .+10
006156  004767  010256                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;R0 IS NOT EQUAL TO 177525
006162  000111                         111
006164  022701  052525                 CMP     #52525,%0!1     ;IS THE RESULT 52525?
006170  001403                         BEQ     .+10
006172                                 1$:
006172  004767  010242                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
006176  000112                         112
006200  021527  000206                 CMP     (R5),#206               ;IS THE $TESTN = #206?
006204  001372                         BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
006206  005215                         INC     (R5)


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

006210  010701                         TST207: SCOPE1
006212  012700  125252                         MOV     #125252,%0              ;LOAD R0 WITH 125252
006216  012701  125252                         MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
006222  000241                         CLC
006224  073077  172226                 ASHC    @S2,%0          ;SHIFT R0,R0!1 BY @S2
006230  106737  000432                 MFPS    @#PSWORD        ;SAVE PS
006234  122737  000010  000432         CMPB    #10,@#PSWORD    ;IS THE PS 10?
006242  001403                         BEQ     .+10
006244  004767  010170                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;THE PS IS NOT EQUAL TO 10
006250  000113                         113
006252  022700  177525                 CMP     #177525,%0      ;IS THE RESULT 177525?
006256  001403                         BEQ     .+10
006260  004767  010154                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;R0 IS NOT EQUAL TO 177525
006264  000114                         114
006266  022701  052525                 CMP     #52525,%0!1     ;IS THE RESULT 52525?
006272  001403                         BEQ     .+10
006274                                 1$:
006274  004767  010140                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                               ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
```

```
;1598  006300  000115                    115
;1599  006302  021527  000207            CMP     (R5),#207               ;IS THE $TESTN = #207?
;1600  006306  001372                    BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
;1601  006310  005215                    INC     (R5)
;1602
;1603
```

```
1604                                    ;*****************************************************************
1605                                    ;TEST:210       125252 125252 SHIFTED BY @#S1 = 177525 52525  PS = 10
1606                                    ;*****************************************************************
1607
1608  006312  010701                    TST210: SCOPE1
1609  006314  012700  125252                    MOV     #125252,%0              ;LOAD R0 WITH 125252
1610  006320  012701  125252                    MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
1611  006324  000241                            CLC
1612  006326  073037  000454                    ASHC    @#S1,%0         ;SHIFT R0,R0!1 BY @#S1
1613  006332  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
1614  006336  122737  000010  000432           CMPB    #10,@#PSWORD    ;IS THE PS 10?
1615  006344  001403                            BEQ     .+10
1616  006346  004767  010066                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1617                                                                    ;THE PS IS NOT EQUAL TO 10
1618  006352  000116                            116
1619  006354  022700  177525                    CMP     #177525,%0      ;IS THE RESULT 177525?
1620  006360  001403                            BEQ     .+10
1621  006362  004767  010052                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1622                                                                    ;R0 IS NOT EQUAL TO 177525
1623  006366  000117                            117
1624  006370  022701  052525                    CMP     #52525,%0!1     ;IS THE RESULT 52525?
1625  006374  001403                            BEQ     .+10
1626  006376                            1$:
1627  006376  004767  010036                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1628                                                                    ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
1629  006402  000120                            120
1630  006404  021527  000210                    CMP     (R5),#210               ;IS THE $TESTN = #210?
1631  006410  001372                            BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
1632  006412  005215                            INC     (R5)
1633
1634
1635                                    ;*****************************************************************
1636                                    ;TEST:211       125252 125252 SHIFTED BY (3) = 177525 52525  PS = 10
1637                                    ;*****************************************************************
1638
1639  006414  010701                    TST211: SCOPE1
1640  006416  012700  125252                    MOV     #125252,%0              ;LOAD R0 WITH 125252
1641  006422  012701  125252                    MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
1642  006426  000241                            CLC
1643  006430  073013                            ASHC    (3),%0          ;SHIFT R0,R0!1 BY (3)
1644  006432  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
1645  006436  122737  000010  000432           CMPB    #10,@#PSWORD    ;IS THE PS 10?
1646  006444  001403                            BEQ     .+10
1647  006446  004767  007766                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1648                                                                    ;THE PS IS NOT EQUAL TO 10
1649  006452  000121                            121
1650  006454  022700  177525                    CMP     #177525,%0      ;IS THE RESULT 177525?
1651  006460  001403                            BEQ     .+10
1652  006462  004767  007752                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1653                                                                    ;R0 IS NOT EQUAL TO 177525
1654  006466  000122                            122
1655  006470  022701  052525                    CMP     #52525,%0!1     ;IS THE RESULT 52525?
1656  006474  001403                            BEQ     .+10
1657  006476                            1$:
1658  006476  004767  007736                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1659                                                                    ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
```

```
1660  006502  000123                        123
1661  006504  021527  000211                CMP     (R5),#211           ;IS THE $TESTN = #211?
1662  006510  001372                        BNE     1$                  ;IF NOT THEN GO TO HLT ABOVE
1663  006512  005215                        INC     (R5)
1664
1665
```

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

006514  010701          TST212: SCOPE1
006516  012700  125252          MOV     #125252,%0              ;LOAD R0 WITH 125252
006522  012701  125252          MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
006526  000241                  CLC
006530  073023                  ASHC    (3)+,%0         ;SHIFT R0,R0!1 BY (3)+
006532  106737  000432          MFPS    @#PSWORD        ;SAVE PS
006536  122737  000010  000432  CMPB    #10,@#PSWORD    ;IS THE PS 10?
006544  001403                  BEQ     .+10
006546  004767  007666          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH ,ALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10

006552  000124                  124
006554  022700  177525          CMP     #177525,%0      ;IS THE RESULT 177525?
006560  001403                  BEQ     .+10
006562  004767  007652          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525

006566  000125                  125
006570  022701  052525          CMP     #52525,%0!1     ;IS THE RESULT 52525?
006574  001403                  BEQ     .+10
006576                  1$:
006576  004767  007636          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE

006602  000126                  126
006604  021527  000212          CMP     (R5),#212               ;IS THE $TESTN = #212?
006610  001372                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
006612  005215                  INC     (R5)



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

006614  010701          TST213: SCOPE1
006616  012700  125252          MOV     #125252,%0              ;LOAD R0 WITH 125252
006622  012701  125252          MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
006626  000241                  CLC
006630  073043                  ASHC    -(3),%0         ;SHIFT R0,R0!1 BY -(3).
006632  106737  000432          MFPS    @#PSWORD        ;SAVE PS
006636  122737  000010  000432  CMPB    #10,@#PSWORD    ;IS THE PS 10?
006644  001403                  BEQ     .+10
006646  004767  007566          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;THE PS IS NOT EQUAL TO 10

006652  000127                  127
006654  022700  177525          CMP     #177525,%0      ;IS THE RESULT 177525?
006660  001403                  BEQ     .+10
006662  004767  007552          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;R0 IS NOT EQUAL TO 177525

006666  000130                  130
006670  022701  052525          CMP     #52525,%0!1     ;IS THE RESULT 52525?
006674  001403                  BEQ     .+10
006676                  1$:
006676  004767  007536          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
```

```
                                                131
                                        CMP     (R5),#213               ;IS THE $TESTN = #213?
                                        BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
                                        INC     (R5)
```

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

006714  010701                          TST214: SCOPE1
006716  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
006722  012701  125252                          MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
006726  000241                                  CLC
006730  073064  000002                          ASHC    2(4),%0         ;SHIFT R0,R0!1 BY 2(4.
006734  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
006740  122737  000011  000432                  CMPB    #11,@#PSWORD    ;IS THE PS 11?
006746  001403                                  BEQ     .+10
006750  004767  007464                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 11
006754  000132                                  132
006756  022700  177252                          CMP     #177252,%0      ;IS THE RESULT 177252?
006762  001403                                  BEQ     .+10
006764  004767  007450                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177252
006770  000133                                  133
006772  022701  125252                          CMP     #125252,%0!1    ;IS THE RESULT 125252?
006776  001403                                  BEQ     .+10
007000                                  1$:
007000  004767  007434                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R0!1 IS NOT EQUAL TO 125252 OR INCORRECT SEQUENCE
007004  000134                                  134
007006  021527  000214                          CMP     (R5),#214               ;IS THE $TESTN = #214?
007012  001372                                  BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
007014  005215                                  INC     (R5)


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

007016  010701                          TST215: SCOPE1
007020  012700  125252                          MOV     #125252,%0              ;LOAD R0 WITH 125252
007024  012701  125252                          MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
007030  000241                                  CLC
007032  073074  000000                          ASHC    @(4),%0         ;SHIFT R0,R0!1 BY @(4.
007036  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
007042  122737  000010  000432                  CMPB    #10,@#PSWORD    ;IS THE PS 10?
007050  001403                                  BEQ     .+10
007052  004767  007362                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;THE PS IS NOT EQUAL TO 10
007056  000135                                  135
007060  022700  177525                          CMP     #177525,%0      ;IS THE RESULT 177525?
007064  001403                                  BEQ     .+10
007066  004767  007346                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R0 IS NOT EQUAL TO 177525
007072  000136                                  136
007074  022701  052525                          CMP     #52525,%0!1     ;IS THE RESULT 52525?
007100  001403                                  BEQ     .+10
007102                                  1$:
007102  004767  007332                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
```

```
                                                137
                                        CMP     (R5),#215               ;IS THE $TESTN = #215?
                                        BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
                                        INC     (R5)
```

```
DF.ACA  MACY11 30.1046)  04-AUG-77  14:09  PAGE 44
DF.ACA.SRC    18-NOV-75 00:00          ASHC INSTRUCTION TESTS

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

007120  010701                         TST216: SCOPE1
007122  012700  125252                         MOV     #125252,%0              ;LOAD R0 WITH 125252
007126  012701  125252                         MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
007132  000241                               CLC
007134  073034                               ASHC    @(4)+,%0                ;SHIFT R0,R0!1 BY @(4)+
007136  106737  000432                       MFPS    @#PSWORD        ;SAVE PS
007142  122737  000010  000432               CMPB    #10,@#PSWORD    ;IS THE PS 10?
007150  001403                               BEQ     .+10
007152  004767  007262                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;THE PS IS NOT EQUAL TO 10
007156  000140                               140
007160  022700  177525                       CMP     #177525,%0      ;IS THE RESULT 177525?
007164  001403                               BEQ     .+10
007166  004767  007246                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R0 IS NOT EQUAL TO 177525
007172  000141                               141
007174  022701  052525                       CMP     #52525,%0!1     ;IS THE RESULT 52525?
007200  001403                               BEQ     .+10
007202                                 1$:
007202  004767  007232                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
007206  000142                               142
007210  021527  000216                       CMP     (R5),#216               ;IS THE $TESTN = #216?
007214  001372                               BNE     1$              ;IF NOT THEN GO TO HLT ABOVE
007216  005215                               INC     (R5)


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

007220  010701                         TST217: SCOPE1
007222  012700  125252                         MOV     #125252,%0              ;LOAD R0 WITH 125252
007226  012701  125252                         MOV     #125252,%0!1    ;LOAD R0!1 WITH 125252
007232  000241                               CLC
007234  073054                               ASHC    @-(4),%0                ;SHIFT R0,R0!1 BY @-(4)
007236  106737  000432                       MFPS    @#PSWORD        ;SAVE PS
007242  122737  000010  000432               CMPB    #10,@#PSWORD    ;IS THE PS 10?
007250  001403                               BEQ     .+10
007252  004767  007162                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;THE PS IS NOT EQUAL TO 10
007256  000143                               143
007260  022700  177525                       CMP     #177525,%0      ;IS THE RESULT 177525?
007264  001403                               BEQ     .+10
007266  004767  007146                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R0 IS NOT EQUAL TO 177525
007272  000144                               144
007274  022701  052525                       CMP     #52525,%0!1     ;IS THE RESULT 52525?
007300  001403                               BEQ     .+10
007302                                 1$:
007302  004767  007132                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;R0!1 IS NOT EQUAL TO 52525 OR INCORRECT SEQUENCE
```

```
 :846  007306  000145                        145
 :847  007310  021527  000217                CMP     (R5),#217               ;IS THE $TESTN = #217
 :848  007314  001372                        BNE     1$                      ;IF NOT THEN GO TO HLT ABOVE
 :849  007316  005215                        INC     (R5)
```

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



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

007320  012701                  TST220: SCOPE
007322  012700  000001                  MOV     #1,%0           ;LOAD MULTIPLICAND WITH 1
007326  070027  000000                  MUL     #0,%0           ;MULTIPLY 1 * #0
007332  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
007336  122737  000004  000432          CMPB    #4,@#PSWORD     ;IS PS = 4
007344  001403                          BEQ     .+10
007346  004767  007066                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
007352  000146                          146
007354  022700  000000                  CMP     #0,%0           ;IS HIGH ORDER = 0
007360  001403                          BEQ     .+10
007362  004767  007052                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
007366  000147                          147
007370  022701  000000                  CMP     #0,%0+1         ;IS LOW ORDER = 0
007374  001403                          BEQ     .+10
007376                          1$:
007376  004767  007036                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
007402  000150                          150
007404  021527  000220                  CMP     (R5),#220
007410  003[illegible]                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HALT ABOVE
007412  005215                          INC     (R5)
```

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

007414  010701                  TST221: SCOPE
007416  012700  177777                  MOV     #-1,%0          ;LOAD MULTIPLICAND WITH -1
007422  070027  000001                  MUL     #1,%0           ;MULTIPLY -1 * #1
007426  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
007432  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS PS = 10
007440  001403                          BEQ     .+10
007442  004767  006772                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
007446  000151                          151
007450  022700  177777                  CMP     #-1,%0          ;IS HIGH ORDER = -1
007454  001403                          BEQ     .+10
007456  004767  006756                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
007462  000152                          152
007464  022701  177777                  CMP     #-1,%0+1        ;IS LOW ORDER = -1
007470  001403                          BEQ     .+10
007472                          1$:
007472  004767  006742                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
007476  000153                          153
007500  021527  000221                  CMP     (R5),#221
007504  001376                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
007506  005725                          TST     (R5)+
```

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

007510  010701                  TST222: SCOPE
007512  012702  000002                  MOV     #2,%2           ;LOAD MULTIPLICAND WITH 2
007516  070227  000002                  MUL     #2,%2           ;MULTIPLY 2 * #2
007522  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
007526  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
007534  001403                          BEQ     .+10
007536  004767  006676                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
007542  000154                          154
007544  022702  000000                  CMP     #0,%2           ;IS HIGH ORDER = 0
007550  001403                          BEQ     .+10
007552  004767  006662                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
007556  000155                          155
007560  022703  000004                  CMP     #4,%2!1         ;IS LOW ORDER = 4
007564  001403                          BEQ     .+10
007566                          1$:
007566  004767  006646                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
007572  000156                          156
007574  021527  000222                  CMP     (R5),#222
007600  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
007602  005525                          INC     (R5)
```

```
1953                                    ;*****************************************************************
1954                                    ;TEST:223       MUL     1000 * #200 = 1 0       PS = 1
1955                                    ;*****************************************************************
1956
1957  007604  010701                    TST223: SCOPE
1958  007606  010501                            MOV     R5,R1           ;SAVE R5
1959  007610  012704  001000                    MOV     #1000,%4        ;LOAD MULTIPLICAND WITH 1000
1960  007614  070427  000200                    MUL     #200,%4         ;MULTIPLY 1000 * #200
1961  007620  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
1962  007624  122737  000001  000432          CMPB    #1,@#PSWORD     ;IS PS = 1
1963  007632  001403                            BEQ     .+10
1964  007634  004767  006600                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1965                                                                    ;PS IS WRONG
1966  007640  000157                            157
1967  007642  022704  000001                    CMP     #1,%4           ;IS HIGH ORDER = 1
1968  007646  001403                            BEQ     .+10
1969  007650  004767  006564                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1970                                                                    ;HIGH ORDER IS WRONG
1971  007654  000160                            160
1972  007656  022705  000000                    CMP     #0,%4!1         ;IS LOW ORDER = 0
1973  007662  001403                            BEQ     .+10
1974  007664                            1$:
1975  007664  004767  006550                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
1976                                                                    ;LOW ORDER IS WRONG OR WRONG SEQUENCE
1977  007670  000161                            161
1978  007672  021127  000223                    CMP     (R1),#223               ;CHECK THE TEST NUMBER
1979  007676  001372                            BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
1980  007700  010105                            MOV     R1,R5           ;RESTORE R5
1981  007702  005215                            INC     (R5)
1982
1983
```

MUL INSTRUCTION TESTS

```
 1984                                   ;*****************************************************************
 1985                                   ;TEST:224       MUL     2 * #77777 = 0 177776        PS = 1
 1986                                   ;*****************************************************************
 1987
 1988  007704  010701                   TST224: SCOPE
 1989  007706  012700  000002                   MOV     #2,%0           ;LOAD MULTIPLICAND WITH 2
 1990  007712  070027  077777                   MUL     #77777,%0       ;MULTIPLY 2 * #77777
 1991  007716  106737  000432                   MFPS    @#PSWORD        ;SAVE PS
 1992  007722  122737  000001  000432         CMPB    #1,@#PSWORD     ;IS PS = 1
 1993  007730  001403                         BEQ     .+10
 1994  007732  004767  006502                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 1995                                                                  ;PS IS WRONG
 1996  007736  000162                         162
 1997  007740  022700  000000                 CMP     #0,%0           ;IS HIGH ORDER = 0
 1998  007744  001403                         BEQ     .+10
 1999  007746  004767  006466                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 2000                                                                  ;HIGH ORDER IS WRONG
 2001  007752  000163                         163
 2002  007754  022701  177776                 CMP     #177776,%0!1    ;IS LOW ORDER = 177776
 2003  007760  001403                         BEQ     .+10
 2004  007762                           1$:
 2005  007762  004767  006452                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 2006                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
 2007  007766  000164                         164
 2008  007770  021527  000224                 CMP     (R5),#224
 2009  007774  001372                         BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
 2010  007776  005215                         INC     (R5)
 2011
 2012
```

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

010000  010701                  TST225: SCOPE
010002  012702  007777                  MOV     #7777,%2        ;LOAD MULTIPLICAND WITH 7777
010006  070227  000010                  MUL     #10,%2          ;MULTIPLY 7777 * #10
010012  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
010016  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
010024  001403                          BEQ     .+10
010026  004767  006406                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
010032  000165                          165
010034  022702  000000                  CMP     #0,%2           ;IS HIGH ORDER = 0
010040  001403                          BEQ     .+10
010042  004767  006372                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
010046  000166                          166
010050  022703  077770                  CMP     #77770,%2!1     ;IS LOW ORDER = 77770
010054  001403                          BEQ     .+10
010056                          1$:
010056  004767  006356                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010062  000167                          167
010064  021527  000225                  CMP     (R5),#225
010070  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010072  005215                          INC     (R5)
```

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

010074  010701                  TST226: SCOPE
010076  010501                          MOV     R5,R1           ;SAVE R5
010100  012704  077777                  MOV     #77777,%4       ;LOAD MULTIPLICAND WITH 77777
010104  070427  077777                  MUL     #77777,%4       ;MULTIPLY 77777 * #77777
010110  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
010114  122737  000001  000432          CMPB    #1,@#PSWORD     ;IS PS = 1
010122  001403                          BEQ     .+10
010124  004767  006310                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
010130  000170                          170
010132  022704  037777                  CMP     #37777,%4       ;IS HIGH ORDER = 37777
010136  001403                          BEQ     .+10
010140  004767  006274                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
010144  000171                          171
010146  022705  000001                  CMP     #1,%4!1         ;IS LOW ORDER = 1
010152  001403                          BEQ     .+10
010154                          1$:
010154  004767  006260                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010160  000172                          172
010162  021127  000226                  CMP     (R1),#226               ;CHECK THE TEST NUMBER
010166  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010170  010105                          MOV     R1,R5           ;RESTORE R5
010172  005215                          INC     (R5)
```

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

010174  010701                          TST227: SCOPE
010176  012702  177777                          MOV     #-1,%2          ;LOAD MULTIPLICAND WITH -1
010202  070227  077777                          MUL     #77777,%2       ;MULTIPLY -1 * #77777
010206  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
010212  122737  000010  000432                  CMPB    #10,@#PSWORD    ;IS PS = 10
010220  001403                                  BEQ     .+10
010222  004767  006212                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
010226  000173                                  173
010230  022702  177777                          CMP     #-1,%2          ;IS HIGH ORDER = -1
010234  001403                                  BEQ     .+10
010236  004767  006176                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
010242  000174                                  174
010244  022703  100001                          CMP     #100001,%2!!    ;IS LOW ORDER = 100001
010250  001403                                  BEQ     .+10
010252                                  1$:
010252  004767  006162                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010256  000175                                  175
010260  021527  000227                          CMP     (R5),#227
010264  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010266  005215                                  INC     (R5)
```

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

010270  010701                          TST230: SCOPE
010272  012700  177776                          MOV     #-2,%0          ;LOAD MULTIPLICAND WITH -2
010276  070027  077777                          MUL     #77777,%0       ;MULTIPLY -2 * #77777
010302  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
010306  122737  000011  000432                  CMPB    #11,@#PSWORD    ;IS PS = 11
010314  001403                                  BEQ     .+10
010316  004767  006116                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
010322  000176                                  176
010324  022700  177777                          CMP     #-1,%0          ;IS HIGH ORDER = -1
010330  001403                                  BEQ     .+10
010332  004767  006102                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
010336  000177                                  177
010340  022701  000002                          CMP     #2,%0!1         ;IS LOW ORDER = 2
010344  001403                                  BEQ     .+10
010346                                  1$:
010346  004767  006066                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010352  000200                                  200
010354  021527  000230                          CMP     (R5)+,#230
010360  001370                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010362  005215                                  INC     (R5)
```

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

010364  010701                  TST231: SCOPE
010366  012702  125252                  MOV     #125252,%2      ;LOAD MULTIPLICAND WITH 125252
010372  070227  000002                  MUL     #2,%2           ;MULTIPLY 125252 * #2
010376  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
010402  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
010410  001403                          BEQ     .+10
010412  004767  006022                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
010416  000201                          201
010420  022702  177777                  CMP     #-1,%2          ;IS HIGH ORDER = -1
010424  001403                          BEQ     .+10
010426  004767  006006                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
010432  000202                          202
010434  022703  052524                  CMP     #52524,%2!1     ;IS LOW ORDER = 52524
010440  001403                          BEQ     .+10
010442                          1$:
010442  004767  005772                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010446  000203                          203
010450  021527  000231                  CMP     (R5)+,#231
010454  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010456  005215                          INC     (R5)
```

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

010460  010701                  TST232: SCOPE
010462  010501                          MOV     R5,R1           ;SAVE R5
010464  012704  125252                  MOV     #125252,%4      ;LOAD MULTIPLICAND WITH 125252
010470  070427  040000                  MUL     #40000,%4       ;MULTIPLY 125252 * #40000
010474  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
010500  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
010506  001403                          BEQ     .+10
010510  004767  005724                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
010514  000204                          204
010516  022704  165252                  CMP     #165252,%4      ;IS HIGH ORDER = 165252
010522  001403                          BEQ     .+10
010524  004767  005710                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
010530  000205                          205
010532  022705  100000                  CMP     #100000,%4!1    ;IS LOW ORDER = 100000
010536  001403                          BEQ     .+10
010540                          1$:
010540  004767  005674                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010544  000206                          206
010546  021127  000232                  CMP     (R1),#232               ;CHECK THE TEST NUMBER
010552  001370                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010554  010501                          MOV     R1,R5           ;RESTORE R5
010556  005201                          INC     R1
```

```
CFMACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 57
CFMACA.SRC    18-NOV-75 00:00          MUL INSTRUCTION TESTS

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

010560  010701                         TST233: SCOPE
010562  012700  107070                         MOV     #107070,%0      ;LOAD MULTIPLICAND WITH 107070
010566  070027  107070                         MUL     #107070,%0      ;MULTIPLY 107070 * #107070
010572  106737  000432                         MFPS    @#PSWORD        ;SAVE PS
010576  122737  000001  000432                 CMPB    #1,@#PSWORD     ;IS PS = 1
010604  001403                               BEQ     .+10
010606  004767  005626                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;PS IS WRONG
010612  000207                               207
010614  022700  031222                       CMP     #31222,%0       ;IS HIGH ORDER = 31222
010620  001403                               BEQ     .+10
010622  004767  005612                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;HIGH ORDER IS WRONG
010626  000210                               210
010630  022701  026100                       CMP     #26100,%0!1     ;IS LOW ORDER = 26100
010634  001403                               BEQ     .+10
010636                                 1$:
010636  004767  005576                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010642  000211                               211
010644  021527  000233                       CMP     (R5),#233
010650  001372                               BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
010652  005215                               INC     (R5)
```

```
                                        ;*************************************************************************
                                        ;TEST:234       MUL     -1 * #1 = -1 -1         PS = 10
                                        ;*************************************************************************
                                        
010654  010701                          TST234: SCOPE
010656  012701  177777                          MOV     #-1,%1          ;LOAD MULTIPLICAND WITH -1
010662  070127  000001                          MUL     #1,%1           ;MULTIPLY -1 * #1
010666  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
010672  122737  000010  000432                  CMPB    #10,@#PSWORD    ;IS PS = 10
010700  001403                                  BEQ     .+10
010702  004767  005532                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
010706  000212                                  212
010710  022701  177777                          CMP     #-1,%1          ;IS HIGH ORDER = -1
010714  001403                                  BEQ     .+10
010716  004767  005516                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
010722  000213                                  213
010724  022701  177777                          CMP     #-1,%1!1        ;IS LOW ORDER = -1
010730  001403                                  BEQ     .+10
010732                                  1$:
010732  004767  005502                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
010736  000214                                  214
010740  021527  000234                          CMP     (R5),#234
010744  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HALT ROUTINE
010746  005215                                  INC     (R5)
```

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

010750  010701                  TST235: SCOPE
010752  012703  177777                  MOV     #-1,%3          ;LOAD MULTIPLICAND WITH -1
010756  070327  000000                  MUL     #0,%3           ;MULTIPLY -1 * #0
010762  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
010766  122737  000004  000432          CMPB    #4,@#PSWORD     ;IS PS = 4
010774  001403                        BEQ     .+10
010776  004767  005436                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
011002  000215                        215
011004  022703  000000                CMP     #0,%3           ;IS HIGH ORDER = 0
011010  001403                        BEQ     .+10
011012  004767  005422                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
011016  000216                        216
011020  022703  000000                CMP     #0,%3!1         ;IS LOW ORDER = 0
011024  001403                        BEQ     .+10
011026                          1$:
011026  004767  005436                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
011032  000217                        217
011034  021527  000235                CMP     (R5.,#235
011040  001372                        BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
011042  005215                        INC     (R5.
```

```
                                        ;*****************************************************************
                                        ;TEST:236       MUL     77777 * #100000 = 100000 100000       PS = 1.
                                        ;*****************************************************************

011044  010701                  TST236: SCOPE
011046  010501                          MOV     R5,R1           ;SAVE R5
011050  012705  077777                  MOV     #77777,%5       ;LOAD MULTIPLICAND WITH 77777
011054  070527  100000                  MUL     #100000,%5      ;MULTIPLY 77777 * #100000
011060  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
011064  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
011072  001403                          BEQ     .+10
011074  004767  005340                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
011100  000220                          220
011102  022705  100000                  CMP     #100000,%5      ;IS HIGH ORDER = 100000
011106  001403                          BEQ     .+10
011110  004767  005324                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
011114  000221                          221
011116  022705  100000                  CMP     #100000,%5!1    ;IS LOW ORDER = 100000
011122  001403                          BEQ     .+10
011124                          :5:
011124  004767  005310                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
011130  000222                          222
011132  021127  000236                  CMP     (R1),#236               ;CHECK THE TEST NUMBER
011136  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HALT ROUTINE
                                        MOV     R1,R5           ;RESTORE R5
                                        INC     R5
```

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

011144  010701                          TST237: SCOPE
011146  012701  177777                          MOV     #-1,%1          ;LOAD MULTIPLICAND WITH -1
011152  070127  077777                          MUL     #77777,%1       ;MULTIPLY -1 * #77777
011156  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
011162  122737  000010  000432                  CMPB    #10,@#PSWORD    ;IS PS = 10
011170  001403                                  BEQ     .+10
011172  004767  005242                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
011176  000223                                  223
011200  022701  100001                          CMP     #100001,%1      ;IS HIGH ORDER = 100001
011204  001403                                  BEQ     .+10
011206  004767  005226                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
011212  000224                                  224
011214  022701  100001                          CMP     #100001,%1!1    ;IS LOW ORDER = 100001
011220  001403                                  BEQ     .+10
011222                                  1$:
011222  004767  005212                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
011226  000225                                  225
011230  021527  000237                          CMP     (R5),#237
011234  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
011236  005215                                  INC     (R5)
```

```
                                        ;*****************************************************************
                                        ;TEST:240       MUL     77777 * #77777 = 1 1        PS = 1
                                        ;*****************************************************************
                                        
011240  010701                  TST240: SCOPE
011242  012703  077777                  MOV     #77777,%3       ;LOAD MULTIPLICAND WITH 77777
011246  070327  077777                  MUL     #77777,%3       ;MULTIPLY 77777 * #77777
011252  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
011256  122737  000001  000432          CMPB    #1,@#PSWORD     ;IS PS = 1
011264  001403                          BEQ     .+10
011266  004767  005146                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
011272  000226                          226
011274  022703  000001                  CMP     #1,%3           ;IS HIGH ORDER = 1
011300  001403                          BEQ     .+10
011302  004767  005132                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
011306  000227                          227
011310  022703  000001                  CMP     #1,%3!1         ;IS LOW ORDER = 1
011314  001403                          BEQ     .+10
011316                          1$:
011316  004767  005116                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
011322  000230                          230
011324  021527  000240                  CMP     (R5),#24C
011330  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
011332  005215                          INC     (R5)
```

```
2367                                    ;*****************************************************************
2368                                    ;TEST:241       MUL       2 * #2 = 4 4          PS = 0
2369                                    ;*****************************************************************
2370
2371  011334  010701                    TST241: SCOPE
2372  011336  010501                            MOV     R5,R1           ;SAVE R5
2373  011340  012705  000002                    MOV     #2,%5           ;LOAD MULTIPLICAND WITH 2
2374  011344  070527  000002                    MUL     #2,%5           ;MULTIPLY 2 * #2
2375  011350  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
2376  011354  122737  000000  000432            CMPB    #0,@#PSWORD     ;IS PS = 0
2377  011362  001403                            BEQ     .+10
2378  011364  004767  005050                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2379                                                                    ;PS IS WRONG
2380  011370  000231                            231
2381  011372  022705  000004                    CMP     #4,%5           ;IS HIGH ORDER = 4
2382  011376  001403                            BEQ     .+10
2383  011400  004767  005034                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2384                                                                    ;HIGH ORDER IS WRONG
2385  011404  000232                            232
2386  011406  022705  000004                    CMP     #4,%5!1         ;IS LOW ORDER = 4
2387  011412  001403                            BEQ     .+10
2388  011414                            1$:
2389  011414  004767  005020                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2390                                                                    ;LOW ORDER IS WRONG OR WRONG SEQUENCE
2391  011420  000233                            233
2392  011422  021127  000241                    CMP     (R1),#241               ;CHECK THE TEST NUMBER
2393  011426  001372                            BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
2394  011430  010105                            MOV     R1,R5           ;RESTORE R5
2395  011432  005215                            INC     (R5)
2396
2397
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 64
DFKACA.SRC     18-NOV-75 00:00          MUL INSTRUCTION TESTS

 2398  011434  012702  040000                 MOV     #40000,%2
 2399  011440  012703  000464                 MOV     #S5,%3
 2400  011444  012704  000466                 MOV     #S6,%4
 2401
 2402                                 ;*************************************************************************
 2403                                 ;TEST:242       MUL      125252 * S5 = 165252 100000        PS = 11
 2404                                 ;*************************************************************************
 2405
 2406  011450  010701                 TST242: SCOPE
 2407  011452  012700  125252                 MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
 2408  011456  070067  167002                 MUL     S5,%0           ;MULTIPLY 125252 * S5
 2409  011462  106737  000432                 MFPS    @#PSWORD        ;SAVE PS
 2410  011466  122737  000011  000432         CMPB    #11,@#PSWORD    ;IS PS = 11
 2411  011474  001403                         BEQ     .+10
 2412  011476  004767  004736                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 2413                                                                  ;PS IS WRONG
 2414  011502  000234                         234
 2415  011504  022700  165252                 CMP     #165252,%0      ;IS HIGH ORDER = 165252
 2416  011510  001403                         BEQ     .+10
 2417  011512  004767  004722                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 2418                                                                  ;HIGH ORDER IS WRONG
 2419  011516  000235                         235
 2420  011520  022701  100000                 CMP     #100000,%0+1    ;IS LOW ORDER = 100000
 2421  011524  001403                         BEQ     .+10
 2422  011526                          1$:
 2423  011526  004767  004706                 JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
 2424                                                                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
 2425  011532  000236                         236
 2426  011534  021527  000242                 CMP     (R5),#242
 2427  011540  001372                         BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
 2428  011542  005215                         INC     (R5)
 2429
 2430
```

```
2431                                    ;*****************************************************************************
2432                                    ;TEST:243       MUL     125252 * @S5 = 165252 100000        PS = 11
2433                                    ;*****************************************************************************
2434
2435  011544  010701                    TST243: SCOPE
2436  011546  012700  125252                    MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
2437  011552  070077  166710                    MUL     @S6,%0          ;MULTIPLY 125252 * @S6
2438  011556  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
2439  011562  122737  000011  000432            CMPB    #11,@#PSWORD    ;IS PS = 11
2440  011570  001403                            BEQ     .+10
2441  011572  004767  004642                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2442                                                                    ;PS IS WRONG
2443  011576  000237                            237
2444  011600  022700  165252                    CMP     #165252,%0      ;IS HIGH ORDER = 165252
2445  011604  001403                            BEQ     .+10
2446  011606  004767  004626                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2447                                                                    ;HIGH ORDER IS WRONG
2448  011612  000240                            240
2449  011614  022701  100000                    CMP     #100000,%0!1    ;IS LOW ORDER = 100000
2450  011620  001403                            BEQ     .+10
2451  011622                            1$:
2452  011622  004767  004612                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2453                                                                    ;LOW ORDER IS WRONG OR WRONG SEQUENCE
2454  011626  000241                            241
2455  011630  021527  000243                    CMP     (R5),#243
2456  011634  001372                            BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
2457  011636  005215                            INC     (R5)
2458
2459
```

```
                                        ;*****************************************************************************
                                        ;TEST:244       MUL       125252 * @#55 = 165252 100000        PS = 11
                                        ;*****************************************************************************

011640  010701                          TST244: SCOPE
011642  012700  125252                          MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
011646  070037  000464                          MUL     @#55,%0         ;MULTIPLY 125252 * @#55
011652  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
011656  122737  000011  000432                  CMPB    #11,@#PSWORD    ;IS PS = 11
011664  001403                                  BEQ     .+10
011666  004767  004546                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
011672  000242                                  242
011674  022700  165252                          CMP     #165252,%0      ;IS HIGH ORDER = 165252
011700  001403                                  BEQ     .+10
011702  004767  004532                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
011706  000243                                  243
011710  022701  100000                          CMP     #100000,%0!1    ;IS LOW ORDER = 100000
011714  001403                                  BEQ     .+10
011716                                  1$:
011716  004767  004516                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
011722  000244                                  244
011724  021527  000244                          CMP     (R5)+,#244
011730  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
011732  005215                                  INC     (R5)
```

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

011734  010701                  TST245: SCOPE
011736  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
011742  070002                          MUL     %2,%0           ;MULTIPLY 125252 * %2
011744  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
011750  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
011756  001403                          BEQ     .+10
011760  004767  004454                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
                                        245
011764  000245                          CMP     #165252,%0      ;IS HIGH ORDER = 165252
011766  022700  165252                  BEQ     .+10
011772  001403                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
011774  004767  004440                  ;HIGH ORDER IS WRONG
                                        246
012000  000246                          CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012002  022701  100000                  BEQ     .+10
012006  001403                  :$:
012010                                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
012010  004767  004424                  ;LOW ORDER IS WRONG OR WRONG SEQUENCE
                                        247
012014  000247                          CMP     :R5.,#245
012016  021527  000245                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
012022  001372                          INC     :R5.
012024  005215
```

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

012026  010701                  TST246: SCOPE
012030  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
012034  070023                          MUL     (3)+,%0         ;MULTIPLY 125252 * (3)+
012036  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
012042  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
012050  001403                          BEQ     .+10
012052  004767  004362                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
012056  000250                          250
012060  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
012064  001403                          BEQ     .+10
012066  004767  004346                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
012072  000251                          251
012074  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012100  001403                          BEQ     .+10
012102                          1$:
012102  004767  004332                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
012106  000252                          252
012110  021527  000246                  CMP     (R5)+,#246
012114  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
012116  005215                          INC     (R5)
```

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

012120  010701                  TST247: SCOPE
012122  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
012126  070043                          MUL     -(3),%0         ;MULTIPLY 125252 * -(3)
012130  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
012134  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
012142  001403                          BEQ     .+10
012144  004767  004270                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
012150  000253                          253
012152  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
012156  001403                          BEQ     .+10
012160  004767  004254                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
012164  000254                          254
012166  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012172  001403                          BEQ     .+10
012174                          1$:
012174  004767  004240                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
012200  000255                          255
012202  022705  000247                  CMP     R5 ,#247
012206  001376                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ROUTINE
012210  000005                          RST     R5,
```

```
                                        ;*****************************************************************************
                                        ;TEST:250       MUL     125252 * 2(4) = 165252 100000        PS = 11
                                        ;*****************************************************************************
                                        ;
012212  010701                          TST250: SCOPE
012214  012700  125252                          MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
012220  070064  000002                          MUL     2(4),%0         ;MULTIPLY 125252 * 2(4)
012224  106737  000432                          MFPS    @#PSWORD        ;SAVE PS
012230  122737  000011  000432                  CMPB    #11,@#PSWORD    ;IS PS = 11
012236  001403                                  BEQ     .+10
012240  004767  004174                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
012244  000256                                  256
012246  022700  165252                          CMP     #165252,%0      ;IS HIGH ORDER = 165252
012252  001403                                  BEQ     .+10
012254  004767  004160                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
012260  000257                                  257
012262  022701  100000                          CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012266  001403                                  BEQ     .+10
012270                                  1$:
012270  004767  004144                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
012274  000260                                  260
012276  021527  000250                          CMP     (R5),#250
012302  001372                                  BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
012304  005215                                  INC     (R5)
```

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

012306  010701                  TST251: SCOPE
012310  012700  125252                  MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
012314  070074  000000                  MUL     @(4),%0         ;MULTIPLY 125252 * @(4)
012320  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
012324  122737  000011  000432          CMPB    #11,@#PSWORD    ;IS PS = 11
012332  001403                          BEQ     .+10
012334  004767  004100                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
012340  000261                          261
012342  022700  165252                  CMP     #165252,%0      ;IS HIGH ORDER = 165252
012346  001403                          BEQ     .+10
012350  004767  004064                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;HIGH ORDER IS WRONG
012354  000262                          262
012356  022701  100000                  CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012362  001403                          BEQ     .+10
012364                          1$:
012364  004767  004050                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;LOW ORDER IS WRONG OR WRONG SEQUENCE
012370  000263                          263
012372  022727  000251                  CMP     (R5)+,#251
012376  001372                          BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
012400  005215                          INC     (R5)
```

```
CF.ACA  MACY11 30.(1046)  04-AUG-77  14:09  PAGE 72
CF.ACA.SRC    28-NOV-75 00:00          MUL INSTRUCTION TESTS

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

012402  010701                       TST252: SCOPE
012404  012700  125252                       MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
012410  070034                             MUL     @(4)+,%0        ;MULTIPLY 125252 * @(4)+
012412  106737  000432                       MFPS    @#PSWORD        ;SAVE PS
012416  122737  000011  000432               CMPB    #11,@#PSWORD    ;IS PS = 11
012424  001403                             BEQ     .+10
012426  004767  004006                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;PS IS WRONG
012432  000264                             264
012434  022700  165252                       CMP     #165252,%0      ;IS HIGH ORDER = 165252
012440  001403                             BEQ     .+10
012442  004767  003772                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;HIGH ORDER IS WRONG
012446  000265                             265
012450  022701  100000                       CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012454  001403                             BEQ     .+10
012456                                  1$:
012456  004767  003756                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;LOW ORDER IS WRONG OR WRONG SEQUENCE
012462  000266                             266
012464  021527  000252                       CMP     (R5),#252
012470  001372                             BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
012472  005215                             INC     (R5)
```

```
DFAC0A  MACY11 30.(1046)  04-AUG-77  14:09  PAGE 73
DFAC04.SRC     18-NOV-75 00:00          MUL INSTRUCTION TESTS

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

012474  010701                        TST253: SCOPE
012476  012700  125252                        MOV     #125252,%0      ;LOAD MULTIPLICAND WITH 125252
012502  070054                              MUL     @-(4),%0        ;MULTIPLY 125252 * @-(4,
012504  106737  000432                        MFPS    @#PSWORD        ;SAVE PS
012510  122737  000011  000432                CMPB    #11,@#PSWORD    ;IS PS = 11
012516  001403                              BEQ     .+10
012520  004767  003714                        JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
012524  000267                              267
012526  022700  165252                        CMP     #165252,%0      ;IS HIGH ORDER = 165252
012532  001403                              BEQ     .+10
012534  004767  003700                        JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;HIGH ORDER IS WRONG
012540  000270                              270
012542  022701  100000                        CMP     #100000,%0!1    ;IS LOW ORDER = 100000
012546  001403                              BEQ     .+10
012550                                  1$:
012550  004767  003664                        JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;LOW ORDER IS WRONG OR WRONG SEQUENCE
012554  000271                              271
012556  021527  000253                        CMP     (R5),#253
012562  001372                              BNE     1$              ;IF IN WRONG SEQUENCE GO TO THE HLT ABOVE
012564  005215                              INC     (R5)
```

```
DF*ACA  MACY11 30.(1046)  04-AUG-77  14:09  PAGE 74
DF*ACA.SRC     19-NOV-75 00:00          DIV INSTRUCTION TESTS

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


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

012566  010701                  TST254: SCOPE
012570  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
012574  012701  000004                  MOV     #4,%0+1         ;LOAD LOW ORDER WITH 4
012600  071027  000002                  DIV     #2,%0           ;DIVIDE BY #2
012604  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

012610  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
012616  001403                        BEQ     .+10
012620  004767  003614                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
012624  000272                        272

012626  022700  000002                  CMP     #2,%0           ;IS QUOTIENT = 2
012632  001403                        BEQ     .+10
012634  004767  003600                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
012640  000273                        273

012642  022701  000000                  CMP     #0,%0+1         ;IS REMAINDER = 0
012646  001403                        BEQ     .+10
012650  004767  003564                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
012654  000274                        274
012656  021527  000254                  CMP     (R5),#254
012662  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
012664  004767  003550                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
012670  000275                        275
012672  000215                        RTS     R5
```

```
2732                                    ;*****************************************************************
2733                                    ;TEST:255      DIV     -1 -9. / #3 = -3       REM = 0      PS = 10
2734                                    ;*****************************************************************
2735
2736  012674  010701                    TST255: SCOPE
2737  012676  012702  177777                    MOV     #-1,%2          ;LOAD HIGH ORDER WITH -1
2738  012702  012703  177767                    MOV     #-9.,%2+1       ;LOAD LOW ORDER WITH -9.
2739  012706  071227  000003                    DIV     #3,%2           ;DIVIDE BY #3
2740  012712  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
2741
2742  012716  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS PS = 10
2743  012724  001403                    BEQ     .+10
2744  012726  004767  003506                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2745                                            ;PS IS WRONG
2746  012732  000276                    276
2747
2748  012734  022702  177775                    CMP     #-3,%2          ;IS QUOTIENT = -3
2749  012740  001403                    BEQ     .+10
2750  012742  004767  003472                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2751                                            ;QUOTIENT IS WRONG
2752  012746  000277                    277
2753
2754  012750  022703  000000                    CMP     #0,%2+1         ;IS REMAINDER = 0
2755  012754  001403                    BEQ     .+10
2756  012756  004767  003456                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2757                                            ;WRONG REMAINDER
2758  012762  000300                    300
2759  012764  021527  000255                    CMP     (R5),#255
2760  012770  001403                    BEQ     .+10
2761  012772  004767  003442                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2762                                            ;TEST IS IN WRONG SEQUENCE
2763  013776  000301                    301
2764  014000  005215                    INC     (R5)
2765
```

```
2766                                    ;*****************************************************************
2767                                    ;TEST:256      DIV     0 9. / #2 = 4       REM = 1      PS = 0
2768                                    ;*****************************************************************
2769
2770  013002  010701                   TST256: SCOPE
2771  013004  010501                           MOV     R5,R1           ;SAVE R5
2772  013006  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
2773  013012  012705  000011                  MOV     #9.,%4+1        ;LOAD LOW ORDER WITH 9.
2774  013016  071427  000002                  DIV     #2,%4           ;DIVIDE BY #2
2775  013022  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
2776
2777  013026  122737  000000  000432         CMPB    #0,@#PSWORD     ;IS PS = 0
2778  013034  001403                           BEQ     .+10
2779  013036  004767  003376                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2780                                                                    ;PS IS WRONG
2781  013042  000302                           302
2782
2783  013044  022704  000004                  CMP     #4,%4           ;IS QUOTIENT = 4
2784  013050  001403                           BEQ     .+10
2785  013052  004767  003362                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2786                                                                    ;QUOTIENT IS WRONG
2787  013056  000303                           303
2788
2789  013060  022705  000001                  CMP     #1,%4+1         ;IS REMAINDER = 1
2790  013064  001403                           BEQ     .+10
2791  013066  004767  003346                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2792                                                                    ;WRONG REMAINDER
2793  013072  000304                           304
2794  013074  010105                           MOV     R1,R5           ;RESTORE R5
2795  013076  021527  000256                  CMP     (R5),#256
2796  013102  001403                           BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
2797  013104  004767  003330                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2798                                                                    ;TEST IS IN WRONG SEQUENCE
2799  013110  000305                           305
2800  013112  005215                           INC     (R5)
2801
```

```
2802                                    ;*****************************************************************
2803                                    ;TEST:257      DIV     -1 -9. / #2 = -4       REM = -1      PS = 10
2804                                    ;*****************************************************************
2805
2806  013114  010701                    TST257: SCOPE
2807  013116  012700  177777                   MOV     #-1,%0          ;LOAD HIGH ORDER WITH -1
2808  013122  012701  177767                   MOV     #-9.,%0+1       ;LOAD LOW ORDER WITH -9.
2809  013126  071027  000002                   DIV     #2,%0           ;DIVIDE BY #2
2810  013132  106737  000432                   MFPS    @#PSWORD        ;SAVE PS
2811
2812  013136  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS PS = 10
2813  013144  001403                   BEQ     .+10
2814  013146  004767  003266                   JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2815                                                                   ;PS IS WRONG
2816  013152  000306                   306
2817
2818  013154  022700  177774                   CMP     #-4,%0          ;IS QUOTIENT = -4
2819  013160  001403                   BEQ     .+10
2820  013162  004767  003252                   JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2821                                                                   ;QUOTIENT IS WRONG
2822  013166  000307                   307
2823
2824  013170  022701  177777                   CMP     #-1,%0+1        ;IS REMAINDER = -1
2825  013174  001403                   BEQ     .+10
2826  013176  004767  003236                   JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2827                                                                   ;WRONG REMAINDER
2828  013202  000310                   310
2829  013204  021527  000257                   CMP     (R5),#257
2830  013210  001403                   BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
2831  013212  004767  003222                   JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2832                                                                   ;TEST IS IN WRONG SEQUENCE
2833  013216  000311                   311
2834  013220  005215                   INC     (R5)
2835
```

```
2836                                    ;*****************************************************************************
2837                                    ;TEST:260      DIV     0 2 / #-3 = 0       REM = 2      PS = 4
2838                                    ;*****************************************************************************
2839
2840  013222  010701                    TST260: SCOPE
2841  013224  012702  000000                    MOV     #0,%2           ;LOAD HIGH ORDER WITH 0
2842  013230  012703  000002                    MOV     #2,%2+1         ;LOAD LOW ORDER WITH 2
2843  013234  071227  177775                    DIV     #-3,%2          ;DIVIDE BY #-3
2844  013240  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
2845
2846  013244  122737  000004  000432          CMPB    #4,@#PSWORD     ;IS PS = 4
2847  013252  001403                    BEQ     .+10
2848  013254  004767  003160                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2849                                                                    ;PS IS WRONG
2850  013260  000312                    312
2851
2852  013262  022702  000000                    CMP     #0,%2           ;IS QUOTIENT = 0
2853  013266  001403                    BEQ     .+10
2854  013270  004767  003144                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2855                                                                    ;QUOTIENT IS WRONG
2856  013274  000313                    313
2857
2858  013276  022703  000002                    CMP     #2,%2+1         ;IS REMAINDER = 2
2859  013302  001403                    BEQ     .+10
2860  013304  004767  003130                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2861                                                                    ;WRONG REMAINDER
2862  013310  000314                    314
2863  013312  021527  000260                    CMP     (R5),#260
2864  013316  001403                    BEQ     .+10
2865  013320  004767  003114                    JSR     PC,$HLT         ;IF IN WRONG SEQUENCE GO TO THE HLT
                                                                        ;SEEN AN ERROR, GO TO TH HALT ROUTINE
2866                                                                    ;TEST IS IN WRONG SEQUENCE
2867  013324  000315                    315
2868  013326  005215                    INC     (R5)
2869
```

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

013330  010701                  TST261: SCOPE
013332  010501                          MOV     R5,R1           ;SAVE R5
013334  012704  177777                  MOV     #-1,%4          ;LOAD HIGH ORDER WITH -1
013340  012705  177776                  MOV     #-2,%4+1        ;LOAD LOW ORDER WITH -2
013344  071427  000003                  DIV     #3,%4           ;DIVIDE BY #3
013350  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

013354  122737  000004  000432          CMPB    #4,@#PSWORD     ;IS PS = 4
013362  001403                          BEQ     .+10
013364  004767  003050                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
013370  000316                          316

013372  022704  000000                  CMP     #0,%4           ;IS QUOTIENT = 0
013376  001403                          BEQ     .+10
013400  004767  003034                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
013404  000317                          317

013406  022705  177776                  CMP     #-2,%4+1        ;IS REMAINDER = -2
013412  001403                          BEQ     .+10
013414  004767  003020                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
013420  000320                          320
013422  010105                          MOV     R1,R5           ;RESTORE R5
013424  021527  000261                  CMP     (R5),#261
013430  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
013432  004767  003002                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
013436  000321                          321
013440  000215                          RTS     PC
```

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

013442  010701                      TST262: SCOPE
013444  012700  177777                      MOV     #-1,%0          ;LOAD HIGH ORDER WITH -1
013450  012701  177777                      MOV     #-1,%0+1        ;LOAD LOW ORDER WITH -1
013454  071327  000001                      DIV     #1,%0           ;DIVIDE BY #1
013460  106737  000432                      MFPS    @#PSWORD        ;SAVE PS

013464  122737  000010  000432              CMPB    #10,@#PSWORD    ;IS PS = 10
013472  001403                            BEQ     .+10
013474  004767  002740                      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                    ;PS IS WRONG
013500  000322                            322

013502  022700  177777                      CMP     #-1,%0          ;IS QUOTIENT = -1
013506  001403                            BEQ     .+10
013510  004767  002724                      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                    ;QUOTIENT IS WRONG
013514  000323                            323

013516  022701  000000                      CMP     #0,%0+1         ;IS REMAINDER = 0
013522  001403                            BEQ     .+10
013524  004767  002710                      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                    ;WRONG REMAINDER
013530  000324                            324
013532  021527  000262                      CMP     (R5),#262
013536  001403                            BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
013540  004767  002674                      JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                    ;TEST IS IN WRONG SEQUENCE
013544  000325                            325
013546  005215                            INC     (R5)
```

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

013550  010701                  TST263: SCOPE
013552  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
013556  012701  000000                  MOV     #0,%0+1         ;LOAD LOW ORDER WITH 0
013562  071027  000001                  DIV     #1,%0           ;DIVIDE BY #1
013566  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

013572  122737  000004  000432          CMPB    #4,@#PSWORD     ;IS PS = 4
013600  001403                          BEQ     .+10
013602  004767  002632                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
013606  000326                          326

013610  022700  000000                  CMP     #0,%0           ;IS QUOTIENT = 0
013614  001403                          BEQ     .+10
013616  004767  002616                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
013622  000327                          327

013624  022701  000000                  CMP     #0,%0+1         ;IS REMAINDER = 0
013630  001403                          BEQ     .+10
013632  004767  002602                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
013636  000330                          330
013640  021527  000263                  CMP     (R5),#263
013644  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HALT
013646  004767  002566                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
013652  000331                          331
013654  000215                          RTS     R5
```

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

013656  010701                  TST264: SCOPE
013660  012702  177777                  MOV     #-1,%2          ;LOAD HIGH ORDER WITH -1
013664  012703  125252                  MOV     #125252,%2+1    ;LOAD LOW ORDER WITH 125252
013670  071227  000002                  DIV     #2,%2           ;DIVIDE BY #2
013674  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

013700  122737  000010  000432          CMPB    #10,@#PSWORD    ;IS PS = 10
013706  001403                          BEQ     .+10
013710  004767  002524                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
013714  000332                          332

013716  022702  152525                  CMP     #152525,%2      ;IS QUOTIENT = 152525
013722  001403                          BEQ     .+10
013724  004767  002510                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
013730  000333                          333

013732  022703  000000                  CMP     #0,%2+1         ;IS REMAINDER = 0
013736  001403                          BEQ     .+10
013740  004767  002474                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
013744  000334                          334
013746  021527  000264                  CMP     (R5),#264
013752  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
013754  004767  002460                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
013760  000335                          335
013762  005215                          INC     (R5)
```

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

                                        TST265: SCOPE
014764 010701                                   MOV     R5,R1           ;SAVE R5
014766 010501                                   MOV     #-1,%4          ;LOAD HIGH ORDER WITH -1
014770 012704 177777                            MOV     #-1,%4+1        ;LOAD LOW ORDER WITH -1
014774 012705 177777                            DIV     #-1,%4          ;DIVIDE BY #-1
015000 071427 177777                            MFPS    @#PSWORD        ;SAVE PS
015004 106737 000432

015010 122737 000000 000432                     CMPB    #0,@#PSWORD     ;IS PS = 0
015016 001403                                   BEQ     .+10
015020 004767 002414                            JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
015024 000336                                   336

015026 022704 000001                            CMP     #1,%4           ;IS QUOTIENT = 1
015032 001403                                   BEQ     .+10
015034 004767 002400                            JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
015040 000337                                   337

015042 022705 000000                            CMP     #0,%4+1         ;IS REMAINDER = 0
015046 001403                                   BEQ     .+10
015050 004767 002364                            JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;WRONG REMAINDER
015054 000340                                   340
015056 010105                                   MOV     R1,R5           ;RESTORE R5
015060 021527 000265                            CMP     (R5),#265
015064 001403                                   BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
015066 004767 002346                            JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
015072 000341                                   341
015074 005215                                   INC     (R5)
```

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

                                        TST266: SCOPE
014076  010701                                 MOV     #25253,%0       ;LOAD HIGH ORDER WITH 25253
014100  012700  025253                          MOV     #1,%0+1         ;LOAD LOW ORDER WITH 1
014104  012701  000001                          DIV     #125252,%0      ;DIVIDE BY #125252
014110  071027  125252                          MFPS    @#PSWORD        ;SAVE PS
014114  106737  000432
014120  122737  000010  000432                  CMPB    #10,@#PSWORD    ;IS PS = 10
014126  001403                                  BEQ     .+10
014130  004767  002304                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
014134  000342                                  342
014136  022700  100000                          CMP     #100000,%0      ;IS QUOTIENT = 100000
014142  001403                                  BEQ     .+10
014144  004767  002270                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
014150  000343                                  343
014152  022701  000001                          CMP     #1,%0+1         ;IS REMAINDER = 1
014156  001403                                  BEQ     .+10
014160  004767  002254                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;WRONG REMAINDER
014164  000344                                  344
014166  021527  000266                          CMP     (R5),#266
014172  001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
014174  004767  002240                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
014200  000345                                  345
014202  000215                                  RTS     PC
```

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

014204  010701          TST267: SCOPE
014206  012702  037777          MOV     #37777,%2       ;LOAD HIGH ORDER WITH 37777
014212  012703  077777          MOV     #77777,%2+1     ;LOAD LOW ORDER WITH 77777
014216  071227  077777          DIV     #77777,%2       ;DIVIDE BY #77777
014222  106737  000432          MFPS    @#PSWORD        ;SAVE PS

014226  122737  000000  000432  CMPB    #0,@#PSWORD     ;IS PS = 0
014234  001403                  BEQ     .+10
014236  004767  002176          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;PS IS WRONG
014242  000346                  346

014244  022702  077777          CMP     #77777,%2       ;IS QUOTIENT = 77777
014250  001403                  BEQ     .+10
014252  004767  002162          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;QUOTIENT IS WRONG
014256  000347                  347

014260  022703  077776          CMP     #77776,%2+1     ;IS REMAINDER = 77775
014264  001403                  BEQ     .+10
014266  004767  002146          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;WRONG REMAINDER
014272  000350                  350
014274  021527  000267          CMP     (R5),#267
014300  001403                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HALT
014302  004767  002132          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                        ;TEST IS IN WRONG SEQUENCE

014306  000351                  351
014310  005215                  INC     (R5)
```

```
CP-ACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 86
CP-ACA.SPC    19-NOV-75 00:00          DIV INSTRUCTION TESTS

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

                                       TST270: SCOPE
014312  010701                               MOV     R5,R1           ;SAVE R5
014314  010501                               MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
014316  012704  000000                       MOV     #100000,%4+1    ;LOAD LOW ORDER WITH 100000
014322  012705  100000                       DIV     #2,%4           ;DIVIDE BY #2
014326  071427  000002                       MFPS    @#PSWORD        ;SAVE PS
014332  106737  000432
014336  122737  000000  000432               CMPB    #0,@#PSWORD     ;IS PS = 0
014344  001403                               BEQ     .+10
014346  004767  002066                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;PS IS WRONG
014352  000352                               352
014354  022704  040000                       CMP     #40000,%4       ;IS QUOTIENT = 40000
014360  001403                               BEQ     .+10
014362  004767  002052                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;QUOTIENT IS WRONG
014366  000353                               353
014370  022705  000000                       CMP     #0,%4+1         ;IS REMAINDER = 0
014374  001403                               BEQ     .+10
014376  004767  002036                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;WRONG REMAINDER
014402  000354                               354
014404  010105                               MOV     R1,R5           ;RESTORE R5
014406  021527  000270                       CMP     (R5),#270
014412  001403                               BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
014414  004767  002020                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                     ;TEST IS IN WRONG SEQUENCE
014420  000355                               355
014422  005215                               INC     (R5)
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 87
DF-ACA.SRC    18-NOV-75 00:00          DIV INSTRUCTION TESTS

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

014424  010701                         TST271: SCOPE
014426  012700  177777                         MOV     #177777,%0      ;LOAD HIGH ORDER WITH 177777
014432  012701  077777                         MOV     #77777,%0+1     ;LOAD LOW ORDER WITH 77777
014436  071027  177776                         DIV     #177776,%0      ;DIVIDE BY #177776
014442  106737  000432                         MFPS    @#PSWORD        ;SAVE PS

014446  122737  000000  000432                 CMPB    #0,@#PSWORD     ;IS PS = 0
014454  001403                               BEQ     .+10
014456  004767  001756                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;PS IS WRONG
014462  000356                               356

014464  022700  040000                       CMP     #40000,%0       ;IS QUOTIENT = 40000
014470  001403                               BEQ     .+10
014472  004767  001742                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;QUOTIENT IS WRONG
014476  000357                               357

014500  022701  177777                       CMP     #177777,%0+1    ;IS REMAINDER = 177777
014504  001403                               BEQ     .+10
014506  004767  001726                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;WRONG REMAINDER
014512  000360                               360
014514  021527  000271                       CMP     (R5),#271
014520  001403                               BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
014522  004767  001712                       JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;TEST IS IN WRONG SEQUENCE
014526  000361                               361
014530  005215                               INC     (R5)
```

```
3182                                    ;*************************************************************************
3183                                    ;TEST:272      DIV     0 52525 / #52525 = 1       REM = 0      PS = 0
3184                                    ;*************************************************************************
3185
3186  014532  010701                    TST272: SCOPE
3187  014534  012702  000000                    MOV     #0,%2           ;LOAD HIGH ORDER WITH 0
3188  014540  012703  052525                    MOV     #52525,%2+1     ;LOAD LOW ORDER WITH 52525
3189  014544  071227  052525                    DIV     #52525,%2       ;DIVIDE BY #52525
3190  014550  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
3191
3192  014554  123737  000000  000432            CMPB    #0,@#PSWORD     ;IS PS = 0
3193  014562  001403                    BEQ     .+10
3194  014564  004767  001650                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3195                                            ;PS IS WRONG
3196  014570  000362                    362
3197
3198  014572  022702  000001                    CMP     #1,%2           ;IS QUOTIENT = 1
3199  014576  001403                    BEQ     .+10
3200  014600  004767  001634                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3201                                            ;QUOTIENT IS WRONG
3202  014604  000363                    363
3203
3204  014606  022703  000000                    CMP     #0,%2+1         ;IS REMAINDER = 0
3205  014612  001403                    BEQ     .+10
3206  014614  004767  001620                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3207                                            ;WRONG REMAINDER
3208  014620  000364                    364
3209  014622  021527  000272                    CMP     (R5),#272
3210  014626  001403                    BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
3211  014630  004767  001604                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3212                                            ;TEST IS IN WRONG SEQUENCE
3213  014634  000365                    365
3214  014636  005215                    INC     (R5)
3215
```

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

014640  010701                  TST273: SCOPE
014642  010501                          MOV     R5,R1           ;SAVE R5
014644  012704  000000                  MOV     #0,%4           ;LOAD HIGH ORDER WITH 0
014650  012705  077777                  MOV     #77777,%4+1     ;LOAD LOW ORDER WITH 77777
014654  071427  000000                  DIV     #0,%4           ;DIVIDE BY #0
014660  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
014664  042737  000014  000432          BIC     #14,@#PSWORD

014672  122737  000003  000432          CMPB    #3,@#PSWORD     ;IS PS = 3
014700  001403                          BEQ     .+10
014702  004767  001532                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
014706  000366                          366

014710  010105                          MOV     R1,R5           ;RESTORE R5
014712  021527  000273                  CMP     (R5),#273
014716  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
014720  004767  001514                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
014724  000367                          367
014726  005215                          INC     (R5)
```

```
3242                                    ;#########################################################################
3243                                    ;TEST:274      DIV     77777 177777 / #2 = DUMMY       REM = DUMMY      PS = 2
3244                                    ;#########################################################################
3245
3246  014730  010701                    TST274: SCOPE
3247  014732  012700  077777                    MOV     #77777,%0       ;LOAD HIGH ORDER WITH 77777
3248  014736  012701  177777                    MOV     #177777,%0+1    ;LOAD LOW ORDER WITH 177777
3249  014742  071027  000002                    DIV     #2,%0           ;DIVIDE BY #2
3250  014746  106737  000432                    MFPS    @#PSWORD        ;SAVE PS
3251  014752  042737  000014  000432          BIC     #14,@#PSWORD
3252
3253  014760  122737  000002  000432          CMPB    #2,@#PSWORD     ;IS PS = 2
3254  014766  001403                          BEQ     .+10
3255  014770  004767  001444                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3256                                                                  ;PS IS WRONG
3257  014774  000370                          370
3258
3259  014776  021527  000274                  CMP     (R5),#274
3260  015002  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
3261  015004  004767  001430                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3262                                                                  ;TEST IS IN WRONG SEQUENCE
3263  015010  000371                          371
3264  015012  005215                          INC     (R5)
3265
```

```
3266  015014  012702  000002                  MOV     #2,%2
3267  015020  012703  000474                  MOV     #S9,%3
3268  015024  012704  000476                  MOV     #S10,%4
3269
3270                                  ;*****************************************************************
3271                                  ;TEST:275       DIV     0 52525 / S9 = 25252       REM = 1       PS = C
3272                                  ;*****************************************************************
3273
3274  015030  010701                  TST275: SCOPE
3275  015032  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
3276  015036  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
3277  015042  071067  163426                  DIV     S9,%0           ;DIVIDE BY S9
3278  015046  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
3279
3280  015052  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
3281  015060  001403                  BEQ     .+10
3282  015062  004767  001352                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3283                                                                  ;PS IS WRONG
3284  015066  000372                  372
3285
3286  015070  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
3287  015074  001403                  BEQ     .+10
3288  015076  004767  001336                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3289                                                                  ;QUOTIENT IS WRONG
3290  015102  000373                  373
3291
3292  015104  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
3293  015110  001403                  BEQ     .+10
3294  015112  004767  001322                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3295                                                                  ;WRONG REMAINDER
3296  015116  000374                  374
3297  015120  021527  000275                  CMP     (R5),#275
3298  015124  001403                  BEQ     .+10                    ;IF IN WRONG SEQUENCE GO TO THE HLT
3299  015126  004767  001306                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
3300                                                                  ;TEST IS IN WRONG SEQUENCE
3301  015132  000375                  375
3302  015134  005215                  INC     (R5)
3303
```

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

015136  010701                          TST276: SCOPE
015140  012700  000000                          MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
015144  012701  052525                          MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
015150  071077  163322                          DIV     @S10,%0         ;DIVIDE BY @S10
015154  106737  000432                          MFPS    @#PSWORD        ;SAVE PS

015160  122737  000000  000432                  CMPB    #0,@#PSWORD     ;IS PS = 0
015166  001403                                  BEQ     .+10
015170  004767  001244                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
015174  000376                                  376

015175  022700  025252                          CMP     #25252,%0       ;IS QUOTIENT = 25252
015202  001403                                  BEQ     .+10
015204  004767  001230                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
015210  000377                                  377

015212  022700  000001                          CMP     #1,%0+1         ;IS REMAINDER = 1
015216  001403                                  BEQ     .+10
015220  004767  001214                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;WRONG REMAINDER
015224  000400                                  400
015226  021527  000276                          CMP     (R5),#276
015232  001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HALT
015234  004767  001200                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE
015240  000401                                  401
015242  000215                                  RTS     R5
```

```
                                        ;*************************************************************************
                                        ;TEST:277      DIV     0 52525 / @#59 = 25252       REM = 1      PS = 0
                                        ;*************************************************************************

015244  010701                  TST277: SCOPE
015246  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
015252  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
015256  071037  000474                  DIV     @#59,%0         ;DIVIDE BY @#59
015262  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

015266  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
015274  001403                          BEQ     .+10
015276  004767  001136                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
015302  000402                          402

015304  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
015310  001403                          BEQ     .+10
015312  004767  001122                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
015316  000403                          403

015320  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
015324  001403                          BEQ     .+10
015326  004767  001106                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
015332  000404                          404
015334  021527  000277                  CMP     (R5),#277
015340  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HALT
015342  004767  001072                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
015346  000405                          405
015350  005215                          INC     (R5)
```

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

015352  010701                         TST300: SCOPE
015354  012700  000000                         MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
015360  012701  052525                         MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
015364  071002                               DIV     %2,%0           ;DIVIDE BY %2
015366  106737  000432                         MFPS    @#PSWORD        ;SAVE PS

015372  122737  000000  000432                 CMPB    #0,@#PSWORD     ;IS PS = 0
015400  001403                               BEQ     .+10
015402  004767  001032                         JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;PS IS WRONG
015406  000406                               406

015410  022700  025252                         CMP     #25252,%0       ;IS QUOTIENT = 25252
015414  001403                               BEQ     .+10
015416  004767  001016                         JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;QUOTIENT IS WRONG
015422  000407                               407

015424  022701  000001                         CMP     #1,%0+1         ;IS REMAINDER = 1
015430  001403                               BEQ     .+10
015432  004767  001002                         JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;WRONG REMAINDER
015436  000410                               410
015440  021527  000300                         CMP     (R5),#300
015444  001403                               BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
015446  004767  000766                         JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                       ;TEST IS IN WRONG SEQUENCE
015452  000411                               411
015454  005215                               INC     R5
```

```
                                ;*****************************************************************************
                                ;TEST:301      DIV     0 52525 / (3)+ = 25252       REM = 1      PS = 0
                                ;*****************************************************************************
                                ;
015456  010701                  TST301: SCOPE
015460  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
015464  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
015470  071023                          DIV     (3)+,%0         ;DIVIDE BY (3)+
015472  106737  000432                  MFPS    @#PSWORD        ;SAVE PS
                                ;
015476  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
015504  001403                          BEQ     .+10
015506  004767  000726                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
015512  000412                          412
                                ;
015514  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
015520  001403                          BEQ     .+10
015522  004767  000712                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
015526  000413                          413
                                ;
015530  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
015534  001403                          BEQ     .+10
015536  004767  000676                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
015542  000414                          414
015544  021527  000301                  CMP     (R5),#301
015550  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HALT
015552  004767  000662                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
015556  000415                          415
015560  005215                          INC     (R5)
```

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

015562  010701                          TST302: SCOPE
015564  012700  000000                          MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
015570  012701  052525                          MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
015574  071043                                  DIV     -(3),%0         ;DIVIDE BY -(3)
015576  106737  000432                          MFPS    @#PSWORD        ;SAVE PS

015602  122737  000000  000432                  CMPB    #0,@#PSWORD     ;IS PS = 0
015610  001403                                  BEQ     .+10
015612  004767  000622                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;PS IS WRONG
015616  000416                                  416

015620  022700  025252                          CMP     #25252,%0       ;IS QUOTIENT = 25252
015624  001403                                  BEQ     .+10
015626  004767  000606                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;QUOTIENT IS WRONG
015632  000417                                  417

015634  022701  000001                          CMP     #1,%0+1         ;IS REMAINDER = 1
015640  001403                                  BEQ     .+10
015642  004767  000572                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;WRONG REMAINDER

015646  000420                                  420
015650  021527  000302                          CMP     (R5),#302
015654  001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
015656  004767  000556                          JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                        ;TEST IS IN WRONG SEQUENCE

015662  000421                                  421
015664  005215                                  INC     (R5)
```

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

015666  010701                  TST303: SCOPE
015670  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
015674  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
015700  071064  000002                  DIV     2(4),%0         ;DIVIDE BY 2(4)
015704  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

015710  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
015716  001403                        BEQ     .+10
015720  004767  000514                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
015724  000422                        422

015726  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
015732  001403                        BEQ     .+10
015734  004767  000500                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
015740  000423                        423

015742  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
015746  001403                        BEQ     .+10
015750  004767  000464                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
015754  000424                        424
015756  021527  000303                  CMP     (R5),#303
015762  001403                        BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
015764  004767  000450                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
015770  000425                        425
015772  005215                        INC     (R5)
```

```
DF.ACA  MACY11 30.1046)  04-AUG-77  14:09  PAGE 98
DF.ACA.SRC    18-NOV-75 00:00          DIV INSTRUCTION TESTS

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

016772 010701                          TST304: SCOPE
016774 012700 000000                           MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
016776 012701 052525                           MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
017002 071074 000000                           DIV     @(4),%0         ;DIVIDE BY @(4)
017006 106737 000432                           MFPS    @#PSWORD        ;SAVE PS

017012 122737 000000 000432                    CMPB    #0,@#PSWORD     ;IS PS = 0
017020 001403                                  BEQ     .+10
017022 004767 000406                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                               ;PS IS WRONG
017026 000426                                  426

017030 022700 025252                           CMP     #25252,%0       ;IS QUOTIENT = 25252
017034 001403                                  BEQ     .+10
017036 004767 000372                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                               ;QUOTIENT IS WRONG
017042 000427                                  427

017044 022701 000001                           CMP     #1,%0+1         ;IS REMAINDER = 1
017050 001403                                  BEQ     .+10
017052 004767 000356                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                               ;WRONG REMAINDER

017056 000430                                  430
017060 021527 000304                           CMP     (R5),#304
017064 001403                                  BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
017066 004767 000342                           JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                               ;TEST IS IN WRONG SEQUENCE
017072 000431                                  431
017074 005215                                  INC     (R5)
```

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

016102 010701                   TST305: SCOPE
016104 012700 000000                    MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
016110 012701 052525                    MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
016114 071034                           DIV     @(4)+,%0        ;DIVIDE BY @(4)+
016116 106737 000432                    MFPS    @#PSWORD        ;SAVE PS

016122 122737 000000 000432             CMPB    #0,@#PSWORD     ;IS PS = 0
016130 001403                           BEQ     .+10
016132 004767 000302                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
016136 000432                           432

016140 022700 025252                    CMP     #25252,%0       ;IS QUOTIENT = 25252
016144 001403                           BEQ     .+10
016146 004767 000266                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
016152 000433                           433

016154 022701 000001                    CMP     #1,%0+1         ;IS REMAINDER = 1
016160 001403                           BEQ     .+10
016162 004767 000252                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER

016166 000434                           434
016170 021527 000305                    CMP     (R5),#305
016174 001403                           BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
016176 004767 000236                    JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE

016202 000435                           435
016204 005215                           INC     (R5)
```

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

016206  010701                  TST306: SCOPE
016210  012700  000000                  MOV     #0,%0           ;LOAD HIGH ORDER WITH 0
016214  012701  052525                  MOV     #52525,%0+1     ;LOAD LOW ORDER WITH 52525
016220  071054                          DIV     @-(4),%0        ;DIVIDE BY @-(4)
016222  106737  000432                  MFPS    @#PSWORD        ;SAVE PS

016226  122737  000000  000432          CMPB    #0,@#PSWORD     ;IS PS = 0
016234  001403                          BEQ     .+10
016236  004767  000176                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;PS IS WRONG
016242  000436                          436

016244  022700  025252                  CMP     #25252,%0       ;IS QUOTIENT = 25252
016250  001403                          BEQ     .+10
016252  004767  000162                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;QUOTIENT IS WRONG
016256  000437                          437

016260  022701  000001                  CMP     #1,%0+1         ;IS REMAINDER = 1
016264  001403                          BEQ     .+10
016266  004767  000146                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;WRONG REMAINDER
016272  000440                          440
016274  021527  000306                  CMP     (R5),#306
016300  001403                          BEQ     .+10            ;IF IN WRONG SEQUENCE GO TO THE HLT
016302  004767  000132                  JSR     PC,$HLT         ;SEEN AN ERROR, GO TO TH HALT ROUTINE
                                                                ;TEST IS IN WRONG SEQUENCE
016306  000441                          441
016310  005215                          INC     (R5)
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 101
DFKACA.SRC    18-NOV-75 00:00          DIV INSTRUCTION TESTS

                                       ;*********************************************************************

                                       .SBTTL  END OF PASS ROUTINE

                                       ;*INCREMENT THE PASS NUMBER ($PASS)
                                       ;*TYPE "END PASS"
                                       ;*IF THERES A MONITOR GO TO IT
                                       ;*IF THERE ISN'T JUMP TO BEGIN
                                       ;*IF IT IS DESIRED TO HAVE A BELL INDICATE THE "END OF PASS" LOCATION
                                       ;*$ENDMG CAN BE CHANGED TO 7.

016312                                 $EOP:
016312  010701                                 SCOPE
016314  005267  162066                       INC     $PASS           ;;INCREMENT THE PASS NUMBER
016320  042767  100000  162060               BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
016326  005327                               DEC     (PC)+           ;;LOOP?
016330  000001                         $EOPCT: .WORD   1
016332  003015                               BGT     $DOAGN          ;;YES
016334  012737                               MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
016336  000001                         $ENDCT: .WORD   1
016340  016330                               $EOPCT
016342  000004  016372                       TYPE    ,$ENDMG         ;;TYPE "END PASS"
016346                                 $GET42:

016346  013700  000042                       MOV     @#42,R0         ;;GET MONITOR ADDRESS
016352  001405                               BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
016354  000005                               RESET                   ;;CLEAR THE WORLD
016356  004710                         $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
016360  000240                               NOP                     ;;SAVE ROOM
016362  000240                               NOP                     ;;FOR
016364  000240                               NOP                     ;;ACT11
016366                                 $DOAGN:
016366  000137  000600                       JMP     @#BEGIN         ;;RETURN
016372  005015  047105  020104         $ENDMG: .ASCII  <15><12>/END PASS/
016400  040520  051523
016404     377     377     000         $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
            016410                             .EVEN

016336  000400                         ENDCT:  400

                                       ;*********************************************************************

                                       .SBTTL  POWER FAIL ROUTINE

016410  012737  016420  000024         $PWRDN: MOV     #$PWRUP,@#24
016416  000000                               HALT

016420  012706  000600                 $PWRUP: MOV     #BEGIN,SP       ;RESTORE THE SP
016424  012737  016410  000024               MOV     #$PWRDN,@#24
016432  000004  000522                       TYPE    ,POWER          ;GO AND TYPE "POWER"
016436  000753                               BR      $DOAGN
```

```
3662
3663                                    ;*      HALT ROUTINE
3664                                    ;*      ------------
3665                                    ;*
3666                                    ;*
3667                                    ;*      PROGRAM COMES HERE ON ENCOUNTERING ANY ERROR
3668                                    ;*
3669
3670  016440  017637  000000  000402  $HLT:   MOV     @(SP),@#$FATAL  ;PLACE THE ERROR NUMBER AT LOCATION $FATAL
3671  016446  032777  020000  162026          BIT     #20000,@SWR     ;HAS THE OPERATOR ASKED TO SUPRESS ERROR TYPE OUTS
3672  016454  001046                          BNE     6$
3673  016456  000004  000514                  TYPE    ,$CRLF          ;GO AND TYPE A CR, LF, FOLLOWED BY 3 SPACES
3674  016462  010046                          MOV     R0,-(SP)        ;SAVE R0
3675  016464  112767  000002  161757          MOVB    #2,$TPCNT       ;ALLOW TYPE OUTS OF PC AND ERROR NUMBER
3676  016472  016600  000002                  MOV     2(SP),R0        ;BRING THE RETURN PC IN R0
3677  016476  162700  000004                  SUB     #4,R0
3678  016502  112737  000006  000450  2$:     MOVB    #6,@#TYPCNT     ;ALLOW TYPE OUT OF 6 DIGITS
3679  016510  005046                          CLR     -(SP)
3680  016512  000241                  4$:     CLC
3681  016514  006100                          ROL     R0
3682  016516  006116                          ROL     (SP)            ;BRING THE C BIT FROM R0 IN (SP)
3683  016520  052716  000060                  BIS     #60,(SP)        ;PREPARE TO TYPE IT OUT
3684  016524  004767  000130                  JSR     PC,$TPCHR       ;AND GO TO OUT PUT A CHARACTER
3685  016530  005016                          CLR     (SP)
3686  016532  006100                          ROL     R0
3687  016534  006116                          ROL     (SP)
3688  016536  006100                          ROL     R0
3689  016540  006116                          ROL     (SP)
3690  016542  105367  161702                  DECB    TYPCNT          ;HAS ALL THE SIX CHARACTERS BEEN TYPED ?
3691  016546  001361                          BNE     4$              ;IF NOT THEN REPEAT FROM 4$
3692  016550  005726                          TST     (SP)+           ;RESTORE STACK POINTER
3693  016552  017600  000002                  MOV     @2(SP),R0       ;PREPARE TO OUT PUT THE ERROR NUMBER
3694  016556  000004  000516                  TYPE    ,$CRLF+2        ;GO AND TYPE 3 SPACES
3695  016562  105367  161663                  DECB    $TPCNT          ;IF BOTH PC AND ERROR NUMBER HAS NOT BEEN
3696  016566  001345                          BNE     2$              ;REPORTED THEN REPEAT FROM 2$
3697  016570  012600                          MOV     (SP)+,R0        ;RESTORE R0
3698  016572  105767  161622          8$:     TSTB    $ENV            ;IF WE ARE NOT UNDER APT. THEN GO TO
3699  016576  001403                          BEQ     8$              ;8$
3700  016600  005237  000400                  INC     @#$MSGTY        ;OTHERWISE INFORM APT. ABOUT SEEING THE ERROR
3701  016604  000777                          BR      .               ;AND LOOP
3702  016606  005777  161670          8$:     TST     @SWR    ;IS IT REQUIRED TO HALT ON ERROR ?
3703  016612  100001                          BPL     10$             ;IF NOT THEN GO TO 10$
3704  016614  000000                          HALT
3705  016616  062716  000002          10$:    ADD     #2,(SP)         ;ADJUST THE RETURN ADDRESS
3706  016622  000207                          RTS     PC              ;AND RETURN
```

```
 3707
 3708                                   ;*      TYPE OUT ROUTINE
 3709                                   ;*      ----------------
 3710                                   ;*
 3711                                   ;*
 3712                                   ;*      THIS ROUTINE IS USED TO TYPE ASCIZ MESSAGES
 3713                                   ;*
 3714
 3715  016624  010046                   $TYPE:  MOV     R0,-(SP)        ;SAVE R0
 3716  016626  017600  000002                   MOV     @2(SP),R0       ;GET THE ADDRESS OF THE ASSCIZ STRING
 3717  016632  112046                   2$:     MOVB    (R0)+,-(SP)     ;PUSH THE CHARACTER TO BE TYPED ONTO STACK
 3718  016634  001005                           BNE     4$              ;BRANCH IF IT IS NOT THE TERMINATOR
 3719  016636  005726                           TST     (SP)+
 3720  016640  012600                           MOV     (SP)+,R0        ;OTHERWISE RESTORE THE STACK AND R0
 3721  016642  062716  000002           3$:     ADD     #2,(SP)         ;ADJUST THE RETURN PC
 3722  016646  000002                           RTI                     ;AND RETURN
 3723
 3724  016650  004767  000004           4$:     JSR     PC,$TPCHR       ;GO TO TYPE A CHARACTER
 3725  016654  005726                           TST     (SP)+           ;RESTORE THE STACK POINTER
 3726  016656  000765                           BR      2$              ;AND RETURN TO 2$
 3727
 3728  016660  132737  000040  000421  $TPCHR: BITB    #40,@#$ENVM     ;HAS THE CONSOLE OUTPUTS BEEN SUPPRESSED?
 3729  016666  001006                           BNE     4$              ;IF SO THEN RETURN FROM THE SUBROUTINE VIA RTI
 3730  016670  105777  161616           2$:     TSTB    @$TPS           ;IS THE PRINTER AVAILABLE?
 3731  016674  100375                           BPL     2$              ;IF NOT THEN LOOP HERE
 3732  016676  116677  000002  161604           MOVB    2(SP),@$TPB     ;OUT PUT THE CHARACTER
 3733  016704  000207                   4$:     RTS     PC
 3734          000001                   .END
```

DF*ACA MACY11 30(1046) 04-AUG-77 14:09 PAGE 105
DF*ACA.SRC 18-NOV-75 00:00 SYMBOL TABLE

```
A      = 016410            DISPRE  000174            TST163  004430            TST247  012120            TTYOUT  000506
ABASE  = 000000            DUMMY = 000000            TST164  004472            TST250  012212            TYPCNT  00045C
ACDW1  = 000000            ENDCT   016336            TST165  004530            TST251  012306            TYPE   = 000004
ACDW2  = 000000            ENT176  005070            TST166  004554            TST252  012402            $APTHD  000430
ACPUOP= 000000             ENT51   002462            TST167  004604            TST253  012474            $CPUOP  000426
ADDW0  = 000000            ERRNM = 000442            TST170  004642            TST254  012566            $CRLF   000514
ADDW1  = 000000            F      = 000063           TST171  004666            TST255  012674            $DEVCT  00041C
ADDW10= 000000             N      = 000307           TST172  004714            TST256  013002            $DOAGN  016366
ADDW11= 000000             NEGAT   002062            TST173  004736            TST257  013114            $ENDAD  016356
ADDW12= 000000             POWER   000522            TST174  004774            TST260  013222            $ENDCT  016336
ADDW13= 000000             PSWORD  000432            TST175  005030            TST261  013330            $ENDMG  016372
ADDW14= 000000             REG01   003504            TST176  005106            TST262  013442            $ENULL  016404
ADDW15= 000000             REG1    001102            TST177  005202            TST263  013550            $ENV    000420
ADDW2  = 000000            REG2    001244            TST200  005276            TST264  013656            $ENVM   000421
ADDW3  = 000000            REG23   003706            TST201  005376            TST265  013764            $EOP    016312
ADDW4  = 000000            REG3    001406            TST202  005472            TST266  014076            $EOPCT  016330
ADDW5  = 000000            REG4    001546            TST203  005566            TST267  014204            $ETABL  000420
ADDW6  = 000000            REG45   004104            TST204  005666            TST270  014312            $ETEND  000430
ADDW7  = 000000            REG5    001712            TST205  005762            TST271  014424            $FATAL  000402
ADDW8  = 000000            RESTRT  000222            TST206  006106            TST272  014532            $GET42  016346
ADDW9  = 000000            RITSH   004312            TST207  006210            TST273  014640            $HD    = 000003
ADEVCT= 000000             SCOPE = 010701            TST210  006312            TST274  014730            $HIBTS  000430
ADEVM  = 000000            SCOPE1= 010701            TST211  006414            TST275  015030            $HLT    016440
AENV   = 000000            SCOPE3= 010703            TST212  006514            TST276  015136            $MAIL   000400
AENVM  = 000000            START   000740            TST213  006614            TST277  015244            $MBADR  000432
AFATAL= 000000             SWR     000502            TST214  006714            TST300  015352            $MSGAD  000414
AMADR1= 000000             SWREG   000176            TST215  007016            TST301  015456            $MSGLG  000416
AMADR2= 000000             SW09   = 001000           TST216  007120            TST302  015562            $MSGTY  000400
AMADR3= 000000             SW10   = 002000           TST217  007220            TST303  015666            $PASS   000406
AMADR4= 000000             SW11   = 004000           TST220  007320            TST304  015774            $PASTM  000436
AMAMS1= 000000             SW12   = 010000           TST221  007414            TST305  016102            $PWRDN  016410
AMAMS2= 000000             S0      000452            TST222  007510            TST306  016206            $PWRUP  016420
AMAMS3= 000000             S1      000454            TST223  007604            TST37   002110            $SETUP= 000020
AMAMS4= 000000             S10     000476            TST224  007704            TST40   002144            $STUP  = 177777
AMSGAD= 000000             S11     000500            TST225  010000            TST41   002160            $SVPC  = 001000
AMSGLG= 000000             S2      000456            TST226  010074            TST42   002176            $SWR   = 160000
AMSGTY= 000000             S3      000460            TST227  010174            TST43   002232            $SWREG  000422
AMTYP1= 000000             S4      000462            TST230  010270            TST44   002264            $TESTN  000404
AMTYP2= 000000             S5      000464            TST231  010364            TST45   002316            $TN    = 000001
AMTYP3= 000000             S6      000466            TST232  010460            TST46   002350            $TPB    000510
AMTYP4= 000000             S7      000470            TST233  010560            TST47   002406            $TPCHR  016660
APASS  = 000000            S8      000472            TST234  010654            TST50   002436            $TPCNT  000451
APRIOR= 000000             S9      000474            TST235  010750            TST51   002514            $TPS    000512
ASWREG= 000000             TEMP1   000434            TST236  011044            TST52   002574            $TSTM   000434
ATESTN= 000000             TEMP2   000436            TST237  011144            TST53   002654            $TYPE   016624
AUNIT  = 000000            TEMP3   000440            TST240  011240            TST54   002734            $UNIT   000412
AUSWR  = 000000            TEMP4   000442            TST241  011334            TST55   003012            $UNITM  000440
AVECT1= 000000             TEMP5   000444            TST242  011450            TST56   003070            $USWR   000424
AVECT2= 000000             TEMP6   000446            TST243  011544            TST57   003146            .       = 016706
BEGIN   000600             TST160  004346            TST244  011640            TST60   003226            .$X     = 000430
COUNT   000430             TST161  004374            TST245  011734            TST61   003306
DISPLA  000504             TST162  004412            TST246  012026            TST62   003364

. ABS.  016706      000
```

```
DFKACA  MACY11 30(1046)  04-AUG-77  14:09  PAGE 106
DFKACA.SRC     18-NOV-75 00:00              SYMBOL TABLE

 ERRORS DETECTED:  0

 DFKACA,DFKACA=DFKACA.SRC/SOL
 RUN-TIME:  10 11  .2 SECONDS
 RUN-TIME RATIO: 210/22=9.5
 CORE USED:  11K  (21 PAGES)
```