FP11

MODF, MODD

MD-11-DCFPL-B

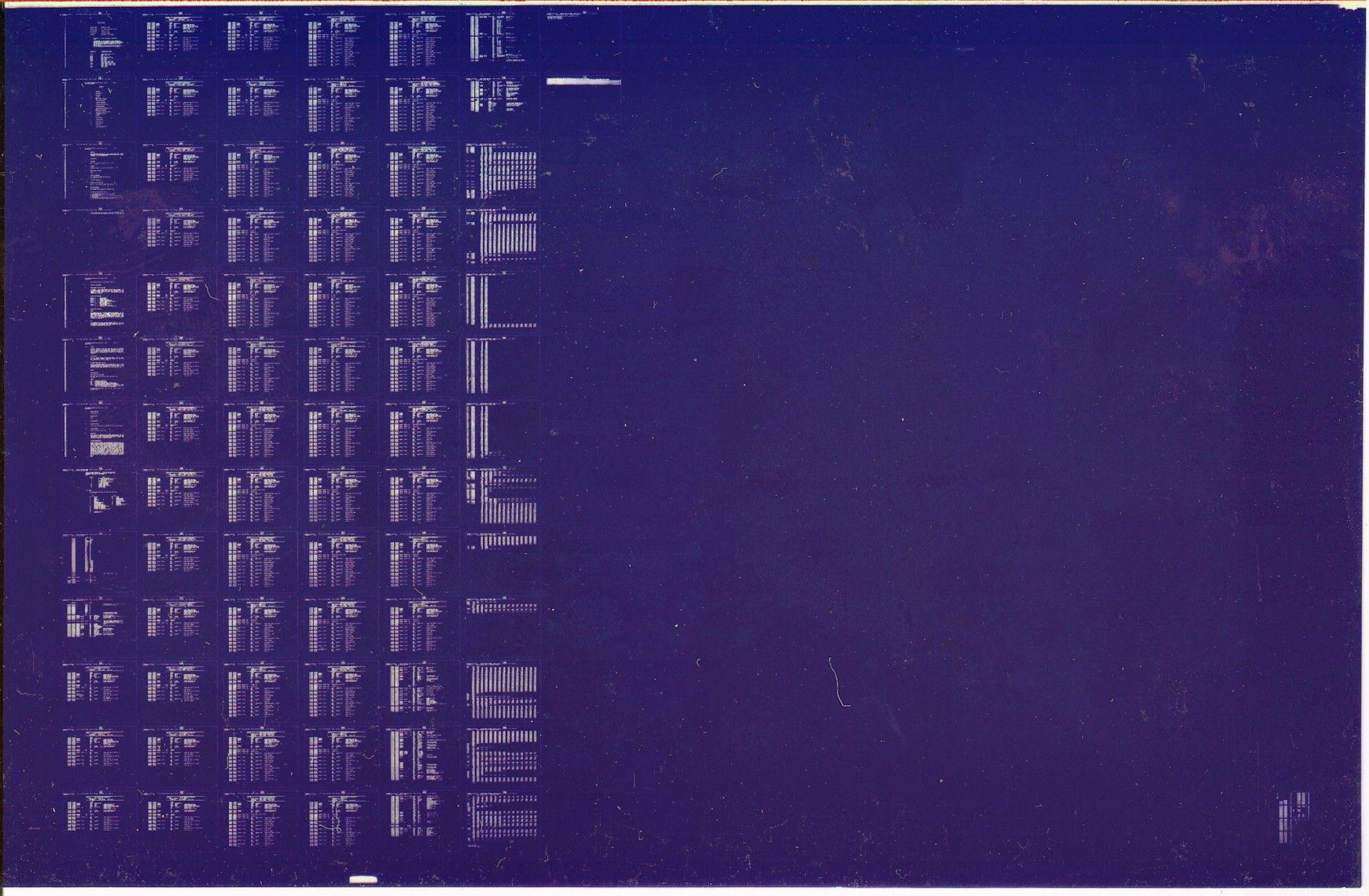
EP-DCFPL-B-DL-A

OCT 1976

FICHE 1 OF 1

digital

Made in U.S.A.



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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DCFPL
PRODUCT NAME: FP11 BASIC INSTRUCTION TESTS
DATE CREATED: MARCH 12, 1973
MAINTAINER: DIAGNOSTIC GROUP
AUTHORS: BOB BRAIN & KEN CHAPMAN

MAINDEC NO.	INSTRUCTIONS TESTED
DCFPA	LDFPS, STFPS, SETI, SETL SETF, SETD, CFCC
DCFPB	STST
DCFPC	LDF, LDD, STF, STD
DCFPD	ADDF, ADDD, SUBF, SUBD
DCFDE	CMDF, CMPD
DCFPF	MULF, MULD
DCFPG	DIVF, DIVD
DCFPH	CLRF, CLRD, TSTF, TSTD ABSF, ABSD, NEGF, NEGD
DCFPI	LDCFD, LDCDF, STCFD, STCDF
DCFPJ	LDCIF, LDCLF, LDCID, LDCLD STCFI, STCFL, STCDI, STCDL
DCFPK	LDEXP, STEXP
DCFPL	MODF, MODD

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DESCRIPTION

1. ABSTRACT

THESE PROGRAMS TEST THE FP11 IN ALL MODES WITH FIXED NUMBER PATTERNS. THE PROGRAMS SHOULD BE RUN IN ORDER FOR AT LEAST 2 PASSES WITH ALL SWITCHES DOWN.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP11/45 STANDARD COMPUTER WITH FP11 OPTION

2.2 STORAGE

PROGRAM STORAGE - THE ROUTINES USE MEMORY 0 - 17776

2.3 PRELIMINARY PROGRAMS

NONE

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5.1.1 (ALL DOWN FOR WORST CASE TESTING)

4.2 STARTING ADDRESS

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200.

4.3 PROGRAM AND/OR OPERATOR ACTION

1) LOAD PROGRAM INTO MEMORY USING ABS LOADER.
2) LOAD ADDRESS 200.
3) SET SWITCHES (SEE SEC 5.1.1) ALL DOWN FOR WORST CASE
4) PRESS START.
5) THE PROGRAM WILL LOOP AND BELL WILL RING ONCE EVERY PASS
6) A MINIMUM OF TWO PASSES SHOULD ALWAYS BE RUN.

```
162                             ;) THE DISPLAY ON THE 11/45 WILL SHOW THE ITERATION COUNT IN
163                             THE LEFT BYTE AND TEST NUMBER IN THE RIGHT.  TO USE, SET THE
```

DESCRIPTION

DATA DISPLAY SWITCH TO THE DISPLAY POSITION.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

AT SA 200 .. ALL SWITCHES DOWN IS WORST CASE TESTING. IF AN ERROR OCCURS, THAT TEST WILL BE LOOPED UPON UNTIL COMPLETION OF 256 CONSECUTIVE PASSES WITH NO ERRORS OF THE SUBTEST IF SW<9> SET TO A 1. THE BELL WILL RING UPON COMPLETION OF A PASS.

5.1.1 SWITCH SETTINGS ARE:

```
SW<15> = 1 ..... HALT ON ERROR
SW<14> = 1 ..... SCOPE LOOP
SW<13> = 1 ..... INHIBIT PRINTOUT
SW<12> = 1 ..... INHIBIT TRACE TRAPPING
SW<11> = 1 ..... INHIBIT ITERATIONS OF SUBTEST
SW<10> = 1 ..... BELL ON ERROR
         0 ..... BELL ON PASS COMPLETE
SW<09> = 1 ..... LOOP ON ERROR
SW<08> = 1 ..... LOOP ON TEST IN SW<7:0>
         0 ..... LOAD SW<7:0> INTO UB REGISTER
```

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST AS IT IS BEING ENTERED IN LOCATION "LAD". IF A SCOPE LOOP IS REQUESTED, THE CURRENT SUBTEST WILL BE LOOPED UPON. SW<11> ON A 1 INHIBITS ITERATION OF SUBTESTS. THE CONTENTS OF LAD MAY BE USED TO DETERMINE THE LAST SUBTEST SUCCESSFULLY COMPLETED.

5.2.2 HLT

THIS ROUTINE PRINTS OUT AN ERROR MESSAGE (SEE 6.1.) IF A HLT IS EXECUTED. THE SUBTEST WILL BE LOOPED UPON UNTIL 256 CONSECUTIVE GOOD PASSES ARE COMPLETED IF SW<9> IS ON A 1. TO INHIBIT TYPEOUTS, PUT SW<13> ON A 1.

5.2.3 TRTRAP

IF SW(12) IS ON A 0, THE T BIT WILL BE SET ON ALTERNATE PASSES. WHEN SET, IT CAUSES A TRAP AFTER EACH INSTRUCTION. THE FIRST INSTRUCTION EXECUTED UPON TRAPPING IS AN "RTT" WHICH RETURNS TO THE INTERRUPTED SEQUENCE OF INSTRUCTIONS. THIS SEQUENCE IS CONTINUED UNTIL THE END OF THE PROGRAM IS REACHED.

5.2.4 TRAPCATCHER

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

5.2.5 FLOATING POINT TRAP (TO 244)

THE FP11 INTERRUPT DISABLE BIT IS ALWAYS SET IN ALL OF THESE TESTS (EXCEPT DCFPA) SO NO TRAPS TO 244 SHOULD OCCUR. IF AN INTERRUPT OCCURS, THE PROGRAM WILL HALT AT 766 IN THE ROUTINE CALLED FLTERR AND DISPLAY THE FPS REGISTER IN R0.

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

```
ADR  FPS  ANS1 ANS2 ANS3 ANS4 ANS5 ANS6 ANS7 ANS8
       FEC FEA
```

WHERE:

```
ADR     = ADDRESS OF ERROR HLT
FPS     = FLOATING POINT STATUS
FEC     = FLOATING EXCEPTION CODES (ERROR CODES)
FEA     = FLOATING EXCEPTION ADDRESS (ERROR ADDRESS)
ANS1-8  = ERROR DATA READ FROM THE FP11.  FROM 0-8  OF  THESE
          MAY  BE TYPED DEPENDING ON THE NUMBER FOLLOWING THE
          HLT; I.E., HLT+3 WOULD TYPE ANS1-ANS3.
```

TO FIND THE FAILING TEST, LOOK AT THE LISTING ABOVE THE ADDRESS TYPED.

6.2 ERROR RECOVERY

RESTART AT 200

7. RESTRICTIONS

NONE

8. MISCELLANEOUS

8.1 EXECUTION TIME

A BELL WILL RING WITHIN 15 SECONDS WITH ALL SWITCHES DOWN.

8.2 STACK POINTER

STACK IS INITALLY SET TO 600

8.3 POWER FAIL

EACH TEST CAN BE POWER FAILED WITH NO ERRORS EXCEPT ON THE FEC AND FEA. TO USE, START THE TEST AS USUAL AND POWER DOWN THEN UP AT ANY TIME. THE PROGRAM SHOULD TYPE "POWER" AND CONTINUE TO RUN WITH NO OTHER TYPEOUTS.

9. PROGRAM DESCRIPTION

THESE PROGRAMS TEST ALL THE INSTRUCTIONS ON THE FP11 IN ALL MODES. EACH PROGRAM HAS MANY SUBTESTS (THE CODE BETWEEN 2 SCOPE STATEMENTS) WHICH ARE RUN 256 TIMES BEFORE CONTINUING TO THE NEXT. SW(11) ON A 1 CAUSES EACH SUBTEST TO BE RUN ONLY ONCE. SW(9) ON A 1 ENABLES LOOP ON ERROR. THE ADDRESS ICNT (LOC 1000) AND DISPLAY REGISTER ON THE 11/45 EACH CONTAIN THE ITERATION COUNT IN THE LEFT BYTE AND THE TEST NUMBER IN THE RIGHT BYTE. ALL THE SUBTESTS SHOULD BE RUN SEQUENTIALLY BY STARTING AT 200 NOT BY STARTING AT THE BEGINNING OF THE SUBTEST. TO LOOP ON A PARTICULAR SUBTEST, PUT THE TEST NUMBER (SEE LISTING) IN THE RIGHT BYTE OF THE SWITCH REGISTER AND SW(8) ON A 1. THIS TEST WILL BE LOOPED UPON UNTIL SW(8) IS PUT ON A 0 OR THE RIGHT BYTE IS CHANGED. IF THE TEST IS NON-EXISTANT, THE PROGRAM WILL BE RUN AS USUAL.

.ENDP

```
.TITLE  MAINDEC-11-DCFPL-B      TEST OF MODF AND MODD
:COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS
:PROGRAM BY BOB BRAIN & KEN CHAPMAN
.REM*
```

SWITCH	USE
8	0 - LOAD UB REGISTER WITH SW<7:0> 1 - LOOP ON TEST IN SW<7:0>
9	LOOP ON ERROR
10	0 - BELL ON PASS COMPLETE 1 - BELL ON ERROR
11	INHIBIT ITERATIONS
12	INHIBIT TRACE TRAP
13	INHIBIT ERROR TYPEOUTS
14	LOOP ON TEST
15	HALT ON ERROR

OUTPUT FORM:

ADR FPS ANS1 ANS2 ANS3 ANS4 ANS5 ANS6 ANS7 ANS8
FEC FEA

FPS BIT	REASON
0	CARRY
1	OVERFLOW
2	ZERO
3	NEGATIVE
4	MAINTAINANCE MODE
5	TRUNCATE MODE
6	LONG INTEGER MODE
7	DOUBLE PRECISION MODE
8	INTERUPT ON CONVERSION ERROR
9	INTERUPT ON OVERFLOW
10	INTERUPT ON UNDERFLOW
11	INTERUPT ON UNDEFINED VARIABLE
12	
13	
14	INTERUPT DISABLE
15	ERROR FLAG*

FEC CODE	ERROR
0	ADDRESS ERROR
2	OPCODE ERROR
4	DIVIDE BY ZERO
6	CONVERSION ERROR
10	OVERFLOW
12	UNDERFLOW
14	UNDEFINED VARIABLE (-C)
16	JBREAK TRAP

```
                                .ENABL  ABS
000001                          N=      1
177776                          PS=     177776
177570                          SWR=    177570
177570                          DISPLAY=SWR
104400                          SCOPE=  TRAP
104000                          HLT=    EMT
000004                          TYPE=   IOT
000007                          BELL=   7
000000                          FPS=    %0
000000                          R0=     %0
000001                          R1=     %1
000002                          R2=     %2
000003                          R3=     %3
000004                          R4=     %4
000005                          R5=     %5
000005                          TTY=    %5
000006                          SP=     %6
000007                          PC=     %7
000000                          AC0=    %0
000001                          AC1=    %1
000002                          AC2=    %2
000003                          AC3=    %3
000004                          AC4=    %4
000005                          AC5=    %5
100000                          SW15=   100000
040000                          SW14=    40000
020000                          SW13=    20000
010000                          SW12=    10000
004000                          SW11=     4000
002000                          SW10=     2000
001000                          SW09=     1000
000400                          SW08=      400
170003                          LDUB=   170003
170005                          STAD=   170005
170007                          STQC=   170007
170006                          MRS=    170006
170004                          LDSC=   170004

000000                          .=      0                       ;TRAP CATCHER FROM 0 - 775

000200                          .=      200

000200  000167  000622                  JMP     BEG

000760                          .=      760
000760  170200                  FLTERR: STFPS   FPS
000762  170367  000034                  STST    FEC
000766  000000                          HALT
000770  000002                          RTI
```

```
                001000                          .=      1000

001000  000000                          ICNT:   0                       ;ITERATION COUNT - LH   TEST NO. - PH
001002  000000                          ANS1:   0                       ;FIRST ANSWER (SEE CODE)
001004  000000                          ANS2:   0
001006  000000                          ANS3:   0
001010  000000                          ANS4:   0
001012  000000                          ANS5:   0
001014  000000                          ANS6:   0
001016  000000                          ANS7:   0
001020  000000                          ANS8:   0
001022  000000                          FEC:    0                       ;FLOATING EXCEPTION CODES
001024  000000                          FEA:    0                       ;FLOATING EXECPTION ADDRESS

001026  012706  000600                  BEG:    MOV     #600,SP         ;** STACK AT 600 **
001032  012737  001054  000004                  MOV     #M1120,@#4      ;FIND OUT WHICH MACHINE THIS IS
001040  005737  177772                        TST     @#177772        ;IS PIRQ THERE?
001044  012767  000006  013634                MOV     #6,YESRT        ;FUDGE IN RTT IF 11/45
001052  000403                              BR      BEGIN

001054  016737  014770  000010  M1120:  MOV     FPTADR,@#10     ;LOAD THE ILLEGAL INSTRUCTION VECTOR
                                                                ; WITH THE ADDRESS OF THE FPU.
                                                                ; THE FPU WILL HANDLE THE BAD OPCODES
001062  012737  000006  000004  BEGIN:  MOV     #6,@#4          ;RESET 4
001070  012706  000600                  MOV     #600,SP
001074  012737  014706  000014          MOV     #YESRT,@#14     ;SET TRACE TRAP VECTOR
001102  012777  015546  014746          MOV     #POWDWN,@DWNVEC
001110  012777  000340  014742          MOV     #340,@DWNVEC+2
001116  012737  015746  000020          MOV     #.IOT,@#20      ;SET UP VECTOR 20
001124  012700  000030                  MOV     #30,R0          ;SET R0 TO VECTOR 30
001130  012720  015050                  MOV     #.TRP,(0)+      ;SET EMT VECTOR
001134  012720  000340                  MOV     #340,(0)+
001140  012720  014710                  MOV     #.EMT,(0)+      ;SET TRAP VECTOR
001144  012710  000340                  MOV     #340,(0)
001150  012777  000760  014674          MOV     #FLTERR,@FPVECT ;LOAD INTERUPT VECTOR
001156  012777  000340  014670          MOV     #340,@FPVECT+2  ;LOCK UP PROCESSOR
001164  005067  177610                  CLR     ICNT
001170  005067  014676                  CLR     LAD
```

```
                        ;*****************************************************************
                        ;TEST 1         TEST OF MODF FPU INSTRUCTION
                        ;     0 0 * 0 0 =  0 0 & 0 0
                        ;       USING AC0       FPS = 47404     FEC = N/A
                        ;*****************************************************************

001174  104400                          SCOPE
001176  170127  047400                  LDFPS   #47404&5776C
001202  172467  000030                  LDF     N1,0            ;LOAD 0 INTO AC0
001206  171467  000030                  MODF    M1,0            ;MODIFY 0 BY 0
001212  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
001214  022700  047404                  CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
001220  001401                          BEQ     .+4             ;BRANCH IF OK
001222  104000                          HLT                     ;FPS NOT EQUAL TO 47404

001224  174067  177552                  STF     0,ANS1          ;STORE FRACTIONAL PART
001230  174167  177552                  STF     0!1,ANS3        ;STORE INTEGER PART
001234  000404                          BR      01

001236  000000  000000          N1:     0.0
001242  000000  000000          M1:     0.0

001246  022767  000000  177526  01:     CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
001254  001401                          BEQ     .+4
001256  104004                          HLT+4                   ;LEFT HALF #0

001260  022767  000000  177516          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
001266  001401                          BEQ     .+4
001270  104004                          HLT+4                   ;RIGHT HALF #0

001272  022767  000000  177506          CMP     #0,ANS3         ;CHECK LEFT HALF OF INTEGER
001300  001401                          BEQ     .+4
001302  104004                          HLT+4                   ;LEFT HALF #0

001304  022767  000000  177476          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
001312  001401                          BEQ     .+4
001314  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 2          TEST OF MODF FPU INSTRUCTION
                        ;     0 0 * 40200 0 =  0 0 & 0 0
                        ;        USING AC0       FPS = 47404     FEC = N/A
                        ;*****************************************************************

001316  104400                      SCOPE
001320  170127  047400              LDFPS   #47404&57760
001324  172467  000030              LDF     N2,0            ;LOAD 0 INTO AC0
001330  171467  000030              MODF    M2,0            ;MODIFY 0 BY 40200
001334  170200                      STFPS   FPS             ;STORE FLOATING POINT STATUS
001336  022700  047404              CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
001342  001401                      BEQ     .+4             ;BRANCH IF OK
001344  104000                      HLT                     ;FPS NOT EQUAL TO 47404

001346  174067  177430              STF     0,ANS1          ;STORE FRACTIONAL PART
001352  174167  177430              STF     0!1,ANS3        ;STORE INTEGER PART
001356  000404                      BR      02

001360  000000  000000      N2:     0,0
001364  040200  000000      M2:     40200.0

001370  022767  000000  177404  02: CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
001376  001401                      BEQ     .+4
001400  104004                      HLT+4                   ;LEFT HALF #0

001402  022767  000000  177374      CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
001410  001401                      BEQ     .+4
001412  104004                      HLT+4                   ;RIGHT HALF #0

001414  022767  000000  177364      CMP     #0,ANS3         ;CHECK LEFT HALF OF INTEGER
001422  001401                      BEQ     .+4
001424  104004                      HLT+4                   ;LEFT HALF #0

001426  022767  000000  177354      CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
001434  001401                      BEQ     .+4
001436  104004                      HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 3         TEST OF MODF FPU INSTRUCTION
                        ;    40200 0 * 0 0 =  0 0 & 0 0
                        ;       USING AC2       FPS = 47404     FEC = N/A
                        ;*****************************************************************

001440  104400                          SCOPE
001442  170127  047400                  LDFPS   #47404&57760
001446  172667  000030                  LDF     N3,2            ;LOAD 40200 INTO AC2
001452  171667  000030                  MODF    M3,2            ;MODIFY 40200 BY 0
001456  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
001460  022700  047404                  CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
001464  001401                          BEQ     .+4             ;BRANCH IF OK
001466  104000                          HLT                     ;FPS NOT EQUAL TO 47404

001470  174267  177306                  STF     2,ANS1          ;STORE FRACTIONAL PART
001474  174367  177306                  STF     2!1,ANS3        ;STORE INTEGER PART
001500  000404                          BR      03

001502  040200  000000          N2:     40200.0
001506  000000  000000          M3:     0,0

001512  022767  000000  177262  03:     CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
001520  001401                          BEQ     .+4
001522  104004                          HLT+4                   ;LEFT HALF #0

001524  022767  000000  177252          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
001532  001401                          BEQ     .+4
001534  104004                          HLT+4                   ;RIGHT HALF #0

001536  022767  000000  177242          CMP     #0,ANS3         ;CHECK LEFT HALF OF INTEGER
001544  001401                          BEQ     .+4
001546  104004                          HLT+4                   ;LEFT HALF #0

001550  022767  000000  177232          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
001556  001401                          BEQ     .+4
001560  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 4          TEST OF MODF FPU INSTRUCTION
                        ;    40200 0 * 40200 0 =  40200 0 3 0 0
                        ;       USING AC2       FPS = 47404     FEC = N/A
                        ;*****************************************************************

001600  104401                          SCOPE
001602  047404                          LDFPS   #47404&577C0
001606  170267  000032                  LDF     44,2            ;LOAD 40200 INTO AC2
001612  170167  000030                  MODF    44,2            ;MODIFY 40200 BY 40200
001616  172667  000026                  STFPS   FPS             ;STORE FLOATING POINT STATUS
001622  027404  047404                  CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
001626  001401                          BEQ     .+4             ;BRANCH IF OK
001630  104000                          HLT                     ;FPS NOT EQUAL TO 47404

001632  174267  177164                  STF     2,ANS1          ;STORE FRACTIONAL PART
001636  174367  177164                  STF     2!1,ANS3        ;STORE INTEGER PART
001642  000404                          BR      .+4

001644  040200  000000          N4:     40200,0
001650  040200  000000          M4:     40200,0

001654  022767  000000  177140  .+4:    CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
001662  001401                          BEQ     .+4
001664  104004                          HLT+4                   ;LEFT HALF #0

001666  022767  000000  177130          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
001674  001401                          BEQ     .+4
001676  104004                          HLT+4                   ;RIGHT HALF #0

001700  022767  040200  177120          CMP     #40200,ANS3     ;CHECK LEFT HALF OF INTEGER
001706  001401                          BEQ     .+4
001710  104004                          HLT+4                   ;LEFT HALF #40200

001712  022767  000000  177110          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
001720  001401                          BEQ     .+4
001722  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 5         TEST OF MODF FPU INSTRUCTION
                        ;    40214 146315 * 40200 C =  40200 0 & 37314 146320
                        ;       USING AC0       FPS = 47400     FEC = N/A
                        ;*****************************************************************

001704  104400                      SCOPE
001706  170127  047400              LDFPS   #47400&57760
001712  172467  000030              LDF     N5,0            ;LOAD 40214 INTO AC0
001716  171467  000030              MODF    M5,0            ;MODIFY 40214 BY 40200
001722  170200                      STFPS   FPS             ;STORE FLOATING POINT STATUS
001724  022700  047400              CMP     #47400,FPS      ;CHECK FLOATING POINT STATUS
001730  001401                      BEQ     .+4             ;BRANCH IF OK
001732  104000                      HLT                     ;FPS NOT EQUAL TO 47400

001734  174067  177042              STF     0,ANS1          ;STORE FRACTIONAL PART
001740  174167  177042              STF     0!1,ANS3        ;STORE INTEGER PART
001744  000404                      BR      05

001746  040214  146315      N5:     40214,146315
001752  040200  000000      M5:     40200,0

001756  022767  037314  177016  05: CMP     #37314,ANS1     ;CHECK LEFT HALF OF FRACTION
001764  001401                      BEQ     .+4
001766  104004                      HLT+4                   ;LEFT HALF #37314

001770  022767  146320  177006      CMP     #146320,ANS2    ;CHECK RIGHT HALF OF FRACTION
001776  001401                      BEQ     .+4
002000  104004                      HLT+4                   ;RIGHT HALF #146320

002002  022767  040200  176776      CMP     #40200,ANS3     ;CHECK LEFT HALF OF INTEGER
002010  001401                      BEQ     .+4
002012  104004                      HLT+4                   ;LEFT HALF #40200

002014  022767  000000  176766      CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002022  001401                      BEQ     .+4
002024  104004                      HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 6         TEST OF MODF FPU INSTRUCTION
                        ;     40414 146315 * 40200 0 =  40400 0 & 37514 146320
                        ;        USING AC2       FPS = 47400     FEC = N/A
                        ;*****************************************************************

002026  104400                          SCOPE
002030  170127  047400                  LDFPS   #47400&57760
002034  172667  000030                  LDF     N6,2            ;LOAD 40414 INTO AC2
002040  171667  000C30                  MODF    M6,2            ;MODIFY 40414 BY 40200
002044  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
002046  022700  047400                  CMP     #47400,FPS      ;CHECK FLOATING POINT STATUS
002052  001401                          BEQ     .+4             ;BRANCH IF OK
002054  104000                          HLT                     ;FPS NOT EQUAL TO 47400

002056  174267  176720                  STF     2,ANS1          ;STORE FRACTIONAL PART
002062  174367  176720                  STF     2!1,ANS3        ;STORE INTEGER PART
002066  000404                          BR      06

002070  040414  146315          N6:     40414,146315
002074  040200  000000          M6:     40200,0

002100  022767  037514  176674  06:     CMP     #37514,ANS1     ;CHECK LEFT HALF OF FRACTION
002106  001401                          BEQ     .+4
002110  104004                          HLT+4                   ;LEFT HALF #37514

002112  022767  146320  176664          CMP     #146320,ANS2    ;CHECK RIGHT HALF OF FRACTION
002120  001401                          BEQ     .+4
002122  104004                          HLT+4                   ;RIGHT HALF #146320

002124  022767  040400  176654          CMP     #40400,ANS3     ;CHECK LEFT HALF OF INTEGER
002132  001401                          BEQ     .+4
002134  104004                          HLT+4                   ;LEFT HALF #40400

002136  022767  000000  176644          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002144  001401                          BEQ     .+4
002146  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 7          TEST OF MODF FPU INSTRUCTION
                        ;     40523 31463 * 40200 0 =  40500 0 & 37631 114630
                        ;        USING AC2       FPS = 47400      FEC = N/A
                        ;*****************************************************************

002150  104400                          SCOPE
002152  170127  047400                  LDFPS   #47400&57760
002156  172667  000030                  LDF     N7,2            ;LOAD 40523 INTO AC2
002162  171667  000030                  MODF    M7,2            ;MODIFY 40523 BY 40200
002166  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
002170  022700  047400                  CMP     #47400,FPS      ;CHECK FLOATING POINT STATUS
002174  001401                          BEQ     .+4             ;BRANCH IF OK
002176  104000                          HLT                     ;FPS NOT EQUAL TO 47400

002200  174267  176576                  STF     2,ANS1          ;STORE FRACTIONAL PART
002204  174367  176576                  STF     2!1,ANS3        ;STORE INTEGER PART
002210  000404                          BR      D7

002212  040523  031463          N7:     40523,31463
002216  040200  000000          M7:     40200,0

002222  022767  037631  176552  D7:     CMP     #37631,ANS1     ;CHECK LEFT HALF OF FRACTION
002230  001401                          BEQ     .+4
002232  104004                          HLT+4                   ;LEFT HALF #37631

002234  022767  114630  176542          CMP     #114630,ANS2    ;CHECK RIGHT HALF OF FRACTION
002242  001401                          BEQ     .+4
002244  104004                          HLT+4                   ;RIGHT HALF #114630

002246  022767  040500  176532          CMP     #40500,ANS3     ;CHECK LEFT HALF OF INTEGER
002254  001401                          BEQ     .+4
002256  104004                          HLT+4                   ;LEFT HALF #40500

002260  022767  000000  176522          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002266  001401                          BEQ     .+4
002270  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 10                TEST OF MODF FPU INSTRUCTION
                        ;    40660 0 * 40200 0 =  40640 0 & 40000 0
                        ;       USING AC0       FPS = 47400     FEC = N/A
                        ;*****************************************************************

002272  104400                          SCOPE
002274  170127  047400                  LDFPS   #47400&57760
002300  172467  000030                  LDF     N10,0           ;LOAD 40660 INTO AC0
002304  171467  000030                  MODF    M10,0           ;MODIFY 40660 BY 40200
002310  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
002312  022700  047400                  CMP     #47400,FPS      ;CHECK FLOATING POINT STATUS
002316  001401                          BEQ     .+4             ;BRANCH IF OK
002320  104000                          HLT                     ;FPS NOT EQUAL TO 47400

002322  174067  176454                  STF     0,ANS1          ;STORE FRACTIONAL PART
002326  174167  176454                  STF     0!1,ANS3        ;STORE INTEGER PART
002332  000404                          BR      010

002334  040660  000000          N10:    40660,0
002340  040200  000000          M10:    40200,0

002344  022767  040000  176430  010:    CMP     #40000,ANS1     ;CHECK LEFT HALF OF FRACTION
002352  001401                          BEQ     .+4
002354  104004                          HLT+4                   ;LEFT HALF #40000

002356  022767  000000  176420          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
002364  001401                          BEQ     .+4
002366  104004                          HLT+4                   ;RIGHT HALF #0

002370  022767  040640  176410          CMP     #40640,ANS3     ;CHECK LEFT HALF OF INTEGER
002376  001401                          BEQ     .+4
002400  104004                          HLT+4                   ;LEFT HALF #40640

002402  022767  000000  176400          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002410  001401                          BEQ     .+4
002412  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 11                TEST OF MODF FPU INSTRUCTION
                        ;    140200 0 * 40200 0 =  140200 0 & 0 0
                        ;       USING AC2        FPS = 47404     FEC = N/A
                        ;*****************************************************************

002414  104400                    SCOPE
002416  170127  047400            LDFPS   #47404&57760
002422  172667  000030            LDF     N11,2           ;LOAD 140200 INTO AC2
002426  171667  000030            MODF    M11,2           ;MODIFY 140200 BY 40200
002432  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
002434  022700  047404            CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
002440  001401                    BEQ     .+4             ;BRANCH IF OK
002442  104000                    HLT                     ;FPS NOT EQUAL TO 47404

002444  174267  176332            STF     2,ANS1          ;STORE FRACTIONAL PART
002450  174367  176332            STF     2!1,ANS3        ;STORE INTEGER PART
002454  000404                    BR      011

002456  140200  000000    N11:    140200,0
002462  040200  000000    M11:    40200,0

002466  022767  000000  176306  011:  CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
002474  001401                    BEQ     .+4
002476  104004                    HLT+4                   ;LEFT HALF #0

002500  022767  000000  176276        CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
002506  001401                    BEQ     .+4
002510  104004                    HLT+4                   ;RIGHT HALF #0

002512  022767  140200  176266        CMP     #140200,ANS3    ;CHECK LEFT HALF OF INTEGER
002520  001401                    BEQ     .+4
002522  104004                    HLT+4                   ;LEFT HALF #140200

002524  022767  000000  176256        CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002532  001401                    BEQ     .+4
002534  104004                    HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 12                TEST OF MODF FPU INSTRUCTION
                        ;    140214 146315 * 40200 0 =  140200 0 & 137314 146320
                        ;       USING AC2       FPS = 47410     FEC = N/A
                        ;*****************************************************************

002536  104400                          SCOPE
002540  170127  047400                  LDFPS   #47410&57760
002544  172667  000030                  LDF     N12,2           ;LOAD 140214 INTO AC2
002550  171667  000030                  MODF    M12,2           ;MODIFY 140214 BY 40200
002554  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
002556  022700  047410                  CMP     #47410,FPS      ;CHECK FLOATING POINT STATUS
002562  001401                          BEQ     .+4             ;BRANCH IF OK
002564  104000                          HLT                     ;FPS NOT EQUAL TO 47410

002566  174267  176210                  STF     2,ANS1          ;STORE FRACTIONAL PART
002572  174367  176210                  STF     2!1,ANS3        ;STORE INTEGER PART
002576  000404                          BR      012

002600  140214  146315          N12:    140214,146315
002604  040200  000000          M12:    40200,0 .

002610  022767  137314  176164  012:    CMP     #137314,ANS1    ;CHECK LEFT HALF OF FRACTION
002616  001401                          BEQ     .+4
002620  104004                          HLT+4                   ;LEFT HALF #137314

002622  022767  146320  176154          CMP     #146320,ANS2    ;CHECK RIGHT HALF OF FRACTION
002630  001401                          BEQ     .+4
002632  104004                          HLT+4                   ;RIGHT HALF #146320

002634  022767  140200  176144          CMP     #140200,ANS3    ;CHECK LEFT HALF OF INTEGER
002642  001401                          BEQ     .+4
002644  104004                          HLT+4                   ;LEFT HALF #140200

002646  022767  000000  176134          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002654  001401                          BEQ     .+4
002656  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 13                TEST OF MODF FPU INSTRUCTION
                        ;    140414 146315 * 40200 0 =  140400 0 & 137514 146320
                        ;      USING AC2      FPS = 47410     FEC = N/A
                        ;*****************************************************************

002660  104400                          SCOPE
002662  170127  047400                  LDFPS   #47410&57760
002666  172667  000030                  LDF     N13,2           ;LOAD 140414 INTO AC2
002672  171667  000030                  MODF    M13,2           ;MODIFY 140414 BY 40200
002676  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
002700  022700  047410                  CMP     #47410,FPS      ;CHECK FLOATING POINT STATUS
002704  001401                          BEQ     .+4             ;BRANCH IF OK
002706  104000                          HLT                     ;FPS NOT EQUAL TO 47410

002710  174267  176066                  STF     2,ANS1          ;STORE FRACTIONAL PART
002714  174367  176066                  STF     2!1,ANS3        ;STORE INTEGER PART
002720  000404                          BR      013

002722  140414  146315          N13:    140414,146315
002726  040200  000000          M13:    40200,0

002732  022767  137514  176042  013:    CMP     #137514,ANS1    ;CHECK LEFT HALF OF FRACTION
002740  001401                          BEQ     .+4
002742  104004                          HLT+4                   ;LEFT HALF #137514

002744  022767  146320  176032          CMP     #146320,ANS2    ;CHECK RIGHT HALF OF FRACTION
002752  001401                          BEQ     .+4
002754  104004                          HLT+4                   ;RIGHT HALF #146320

002756  022767  140400  176022          CMP     #140400,ANS3    ;CHECK LEFT HALF OF INTEGER
002764  001401                          BEQ     .+4
002766  104004                          HLT+4                   ;LEFT HALF #140400

002770  022767  000000  176012          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
002776  001401                          BEQ     .+4
003000  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 14                TEST OF MODF FPU INSTRUCTION
                        ;    140523 31463 * 40200 0 =  140500 0 & 137631 114630
                        ;       USING AC0       FPS = 47410     FEC = N/A
                        ;*****************************************************************

003002  104400                          SCOPE
003004  170127  047400                  LDFPS   #47410&57760
003010  172467  000030                  LDF     N14,0           ;LOAD 140523 INTO AC0
003014  171467  000030                  MODF    M14,0           ;MODIFY 140523 BY 40200
003020  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
003022  022700  047410                  CMP     #47410,FPS      ;CHECK FLOATING POINT STATUS
003026  001401                          BEQ     .+4             ;BRANCH IF OK
003030  104000                          HLT                     ;FPS NOT EQUAL TO 47410

003032  174067  175744                  STF     0,ANS1          ;STORE FRACTIONAL PART
003036  174167  175744                  STF     0!1,ANS3        ;STORE INTEGER PART
003042  000404                          BR      014

003044  140523  031463          N14:    140523,31463
003050  040200  000000          M14:    40200,0

003054  022767  137631  175720  014:    CMP     #137631,ANS1    ;CHECK LEFT HALF OF FRACTION
003062  001401                          BEQ     .+4
003064  104004                          HLT+4                   ;LEFT HALF #137631

003066  022767  114630  175710          CMP     #114630,ANS2    ;CHECK RIGHT HALF OF FRACTION
003074  001401                          BEQ     .+4
003076  104004                          HLT+4                   ;RIGHT HALF #114630

003100  022767  140500  175700          CMP     #140500,ANS3    ;CHECK LEFT HALF OF INTEGER
003106  001401                          BEQ     .+4
003110  104004                          HLT+4                   ;LEFT HALF #140500

003112  022767  000000  175670          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
003120  001401                          BEQ     .+4
003122  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 15                TEST OF MODF FPU INSTRUCTION
                        ;    140660 0 * 40200 0 =  140640 0 & 140000 0
                        ;       USING AC0       FPS = 47410     FEC = N/A
                        ;*****************************************************************

003124  104400                          SCOPE
003126  170127  047400                  LDFPS   #47410&57760
003132  172467  000030                  LDF     N15,0           ;LOAD 140660 INTO AC0
003136  171467  000030                  MODF    M15,0           ;MODIFY 140660 BY 40200
003142  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
003144  022700  047410                  CMP     #47410,FPS      ;CHECK FLOATING POINT STATUS
003150  001401                          BEQ     .+4             ;BRANCH IF OK
003152  104000                          HLT                     ;FPS NOT EQUAL TO 47410

003154  174067  175622                  STF     0,ANS1          ;STORE FRACTIONAL PART
003160  174167  175622                  STF     0!1,ANS3        ;STORE INTEGER PART
003164  000404                          BR      015

003166  140660  000000          N15:    140660,0
003172  040200  000000          M15:    40200,0

003176  022767  140000  175576  015:    CMP     #140000,ANS1    ;CHECK LEFT HALF OF FRACTION
003204  001401                          BEQ     .+4
003206  104004                          HLT+4                   ;LEFT HALF #140000

003210  022767  000000  175566          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
003216  001401                          BEQ     .+4
003220  104004                          HLT+4                   ;RIGHT HALF #0

003222  022767  140640  175556          CMP     #140640,ANS3    ;CHECK LEFT HALF OF INTEGER
003230  001401                          BEQ     .+4
003232  104004                          HLT+4                   ;LEFT HALF #140640

003234  022767  000000  175546          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
003242  001401                          BEQ     .+4
003244  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 16                TEST OF MODF FPU INSTRUCTION
                        ;    52525 52525 * 40200 0 =  52525 52525 & 0 0
                        ;       USING AC0       FPS = 47404     FEC = N/A
                        ;*****************************************************************

003246  104400                          SCOPE
003250  170127  047400                  LDFPS   #47404&57760
003254  172467  000030                  LDF     N16,0           ;LOAD 52525 INTO AC0
003260  171467  000030                  MODF    M16,0           ;MODIFY 52525 BY 40200
003264  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
003266  022700  047404                  CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
003272  001401                          BEQ     .+4             ;BRANCH IF OK
003274  104000                          HLT                     ;FPS NOT EQUAL TO 47404

003276  174067  175500                  STF     0,ANS1          ;STORE FRACTIONAL PART
003302  174167  175500                  STF     0!1,ANS3        ;STORE INTEGER PART
003306  000404                          BR      016

003310  052525  052525          N16     52525,52525
003314  040200  000000          M16:    40200,0

003320  022767  000000  175454  016:    CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
003326  001401                          BEQ     .+4
003330  104004                          HLT+4                   ;LEFT HALF #0

003332  022767  000000  175444          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
003340  001401                          BEQ     .+4
003342  104004                          HLT+4                   ;RIGHT HALF #0

003344  022767  052525  175434          CMP     #52525,ANS3     ;CHECK LEFT HALF OF INTEGER
003352  001401                          BEQ     .+4
003354  104004                          HLT+4                   ;LEFT HALF #52525

003356  022767  052525  175424          CMP     #52525,ANS4     ;CHECK RIGHT HALF OF INTEGER
003364  001401                          BEQ     .+4
003366  104004                          HLT+4                   ;RIGHT HALF #52525
```

```
                        ;*****************************************************************
                        ;TEST 17                TEST OF MODF FFU INSTRUCTION
                        ;    37600 0 * 40200 0 =  0 0 & 37600 0
                        ;       USING AC0       FPS = 47400     FEC = N/A
                        ;*****************************************************************

003370  104400                          SCOPE
003372  170127  047400                  LDFPS   #47400&57760
003376  172467  000030                  LDF     N17,0           ;LOAD 37600 INTO AC0
003402  171467  000030                  MODF    M17,0           ;MODIFY 37600 BY 40200
003406  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
003410  022700  047400                  CMP     #47400,FPS      ;CHECK FLOATING POINT STATUS
003414  001401                          BEQ     .+4             ;BRANCH IF OK
003416  104000                          HLT                     ;FPS NOT EQUAL TO 47400

003420  174067  175356                  STF     0,ANS1          ;STORE FRACTIONAL PART
003424  174167  175356                  STF     0!1,ANS3        ;STORE INTEGER PART
003430  000404                          BR      017

003432  037600  000000          N17:    37600,0
003436  040200  000000          M17:    40200,0

003442  022767  037600  175332  017:    CMP     #37600,ANS1     ;CHECK LEFT HALF OF FRACTION
003450  001401                          BEQ     .+4
003452  104004                          HLT+4                   ;LEFT HALF #37600

003454  022767  000000  175322          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
003462  001401                          BEQ     .+4
003464  104004                          HLT+4                   ;RIGHT HALF #0

003466  022767  000000  175312          CMP     #0,ANS3         ;CHECK LEFT HALF OF INTEGER
003474  001401                          BEQ     .+4
003476  104004                          HLT+4                   ;LEFT HALF #0

003500  022767  000000  175302          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
003506  001401                          BEQ     .+4
003510  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 20                TEST OF MODF FPU INSTRUCTION
                        ;    40200 0 * 20000 0 =  0 0 & 20000 0
                        ;       USING AC0       FPS = 47400     FEC = N/A
                        ;*****************************************************************

003512  104400                          SCOPE
003514  170127  047400                  LDFPS   #47400&57760
003520  172467  000030                  LDF     N20,0           ;LOAD 40200 INTO AC0
003524  171467  000030                  MODF    M20,0           ;MODIFY 40200 BY 20000
003530  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
003532  022700  047400                  CMP     #47400,FPS      ;CHECK FLOATING POINT STATJS
003536  001401                          BEQ     .+4             ;BRANCH IF OK
003540  104000                          HLT                     ;FPS NOT EQUAL TO 47400

003542  174067  175234                  STF     0,ANS1          ;STORE FRACTIONAL PART
003546  174167  175234                  STF     0!1,ANS3        ;STORE INTEGER PART
003552  000404                          BR      020

003554  040200  000000          N20:    40200,0
003560  020000  000000          M20:    20000,0

003564  022767  020000  175210  020:    CMP     #20000,ANS1     ;CHECK LEFT HALF OF FRACTION
003572  001401                          BEQ     .+4
003574  104004                          HLT+4                   ;LEFT HALF #20000

003576  022767  000000  175200          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
003604  001401                          BEQ     .+4
003606  104004                          HLT+4                   ;RIGHT HALF #0

003610  022767  000000  175170          CMP     #0,ANS3         ;CHECK LEFT HALF OF INTEGER
003616  001401                          BEQ     .+4
003620  104004                          HLT+4                   ;LEFT HALF #0

003622  022767  000000  175160          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
003630  001401                          BEQ     .+4
003632  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                                        ;*******************************************************************
                                        ;TEST 21                  TEST OF MODF FPU INSTRUCTION
                                        ;     40600 0 * 37400 0 =  0 0 & 40000 0
                                        ;        USING AC0         FPS = 47400      FEC = N/A
                                        ;*******************************************************************

003634  104400                                  SCOPE
003636  170127  047400                          LDFPS   #47400&57760
003642  172467  000030                          LDF     N21,0           ;LOAD 40600 INTO AC0
003646  171467  000030                          MODF    M21,0           ;MODIFY 40600 BY 37400
003652  170200                                  STFPS   FPS             ;STORE FLOATING POINT STATUS
003654  022700  047400                          CMP     #47400,FPS      ;CHECK FLOATING POINT STATUS
003660  001401                                  BEQ     .+4             ;BRANCH IF OK
003662  104000                                  HLT                     ;FPS NOT EQUAL TO 47400

003664  174067  175112                          STF     0,ANS1          ;STORE FRACTIONAL PART
003670  174167  175112                          STF     0!1,ANS3        ;STORE INTEGER PART
003674  000404                                  BR      021

003676  040600  000000                  N21:    40600,0
003702  037400  000000                  M21:    37400,0

003706  022767  040000  175066  021:    CMP     #40000,ANS1     ;CHECK LEFT HALF OF FRACTION
003714  001401                                  BEQ     .+4
003716  104004                                  HLT+4                   ;LEFT HALF #40000

003720  022767  000000  175056                  CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
003726  001401                                  BEQ     .+4
003730  104004                                  HLT+4                   ;RIGHT HALF #0

003732  022767  000000  175046                  CMP     #0,ANS3         ;CHECK LEFT HALF OF INTEGER
003740  001401                                  BEQ     .+4
003742  104004                                  HLT+4                   ;LEFT HALF #0

003744  022767  000000  175036                  CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
003752  001401                                  BEQ     .+4
003754  104004                                  HLT+4                   ;RIGHT HALF #0
```

```
                        ;*****************************************************************
                        ;TEST 22                TEST OF MODF FPU INSTRUCTION
                        ;    40740 0 * 40500 0 =  41250 0 & 0 0
                        ;       USING AC0       FPS = 47404     FEC = N/A
                        ;*****************************************************************

003756  104400                          SCOPE
003760  170127  047400                  LDFPS   #47404&57760
003764  172467  000030                  LDF     N22.0           ;LOAD 40740 INTO AC0
003770  171467  000030                  MODF    M22.0           ;MODIFY 40740 BY 40500
003774  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
003776  022700  047404                  CMP     #47404,FPS      ;CHECK FLOATING POINT STATUS
004002  001401                          BEQ     .+4             ;BRANCH IF OK
004004  104000                          HLT                     ;FPS NOT EQUAL TO 47404

004006  174067  174770                  STF     0,ANS1          ;STORE FRACTIONAL PART
004012  174167  174770                  STF     0!1,ANS3        ;STORE INTEGER PART
004016  000404                          BR      .22

004020  040740  000000          N22:    40740.0
004024  040500  000000          M22:    40500.0

004030  022767  000000  174744  .22:    CMP     #0,ANS1         ;CHECK LEFT HALF OF FRACTION
004036  001401                          BEQ     .+4
004040  104004                          HLT+4                   ;LEFT HALF #0

004042  022767  000000  174734          CMP     #0,ANS2         ;CHECK RIGHT HALF OF FRACTION
004050  001401                          BEQ     .+4
004052  104004                          HLT+4                   ;RIGHT HALF #0

004054  022767  041250  174724          CMP     #41250,ANS3     ;CHECK LEFT HALF OF INTEGER
004062  001401                          BEQ     .+4
004064  104004                          HLT+4                   ;LEFT HALF #41250

004066  022767  000000  174714          CMP     #0,ANS4         ;CHECK RIGHT HALF OF INTEGER
004074  001401                          BEQ     .+4
004076  104004                          HLT+4                   ;RIGHT HALF #0
```

```
                                ;*****************************************************************
                                ;TEST 23                TEST OF MODD FPU INSTRUCTION
                                ;       0 0 0 0 * 0 0 0 0 =
                                ;       0 0 0 0 & 0 0 0 0
                                ;       USING AC0       FPS = 47604     FEC = N/A
                                ;*****************************************************************
004100  104400                          SCOPE
004102  170127  047600                  LDFPS   #47604&57760
004106  172467  000030                  LDD     N23,0           ;LOAD 0 INTO AC0
004112  171467  000034                  MODD    M23,0           ;MODIFY 0 BY 0
004116  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
004120  022700  047604                  CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
004124  001401                          BEQ     .+4             ;BRANCH IF OK
004126  104000                          HLT                     ;FPS NOT EQUAL TO 47604

004130  174067  174646                  STD     0,ANS1          ;STORE FRACTIONAL PART
004134  174167  174652                  STD     1,ANS5          ;STORE INTEGER PART
004140  000410                          BR      023

004142  000000  000000  000000  N23:    0.0.0.0
004150  000000
004152  000000  000000  000000  M23:    0.0.0.0
004160  000000
004162  022767  000000  174612  023:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
004170  001401                          BEQ     .+4
004172  104010                          HLT+8.                  ;FIRST # 0

004174  022767  000000  174602          CMP     #0,ANS2         ;CHECK SECOND WORD
004202  001401                          BEQ     .+4
004204  104010                          HLT+8.                  ;SECOND # 0

004206  022767  000000  174572          CMP     #0,ANS3         ;CHECK THIRD WORD
004214  001401                          BEQ     .+4
004216  104010                          HLT+8.                  ;THIRD # 0

004220  022767  000000  174562          CMP     #0,ANS4         ;CHECK FORTH
004226  001401                          BEQ     .+4
004230  104010                          HLT+8.                  ;FORTH # 0

004232  022767  000000  174552          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
004240  001401                          BEQ     .+4
004242  104010                          HLT+8.                  ;FIRST # 0

004244  022767  000000  174542          CMP     #0,ANS6         ;CHECK SECOND WORD
004252  001401                          BEQ     .+4
004254  104010                          HLT+8.                  ;SECOND # 0

004256  022767  000000  174532          CMP     #0,ANS7         ;CHECK THIRD WORD
004264  001401                          BEQ     .+4
004266  104010                          HLT+8.                  ;THIRD # 0

004270  022767  000000  174522          CMP     #0,ANS8         ;CHECK FORTH WORD
004276  001401                          BEQ     .+4
004300  104010                          HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 24                TEST OF MODD FPU INSTRUCTION
                                ;       0 0 0 0 * 40200 0 0 0 =
                                ;       0 0 0 0 & 0 0 0 0
                                ;       USING AC0       FPS = 47604     FEC = N/A
                                ;*****************************************************************
004302  104400                          SCOPE
004304  170127  047600                  LDFPS   #47604&57760
004310  172467  000030                  LDD     N24,0           ;LOAD 0 INTO AC0
004314  171467  000034                  MODD    M24,0           ;MODIFY 0 BY 40200
004320  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
004322  022700  047604                  CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
004326  001401                          BEQ     .+4             ;BRANCH IF OK
004330  104000                          HLT                     ;FPS NOT EQUAL TO 47604

004332  174067  174444                  STD     0,ANS1          ;STORE FRACTIONAL PART
004336  174167  174450                  STD     0!1,ANS5        ;STORE INTERGER PART
004342  000410                          BR      D24

004344  000000  000000  000000  N24:    0.0.0.0
004352  000000
004354  040200  000000  000000  M24:    40200.0.0.0
004362  000000
004364  022767  000000  174410  D24:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
004372  001401                          BEQ     .+4
004374  104010                          HLT+8.                  ;FIRST # 0

004376  022767  000000  174400          CMP     #0,ANS2         ;CHECK SECOND WORD
004404  001401                          BEQ     .+4
004406  104010                          HLT+8.                  ;SECOND # 0

004410  022767  000000  174370          CMP     #0,ANS3         ;CHECK THIRD WORD
004416  001401                          BEQ     .+4
004420  104010                          HLT+8.                  ;THIRD # 0

004422  022767  000000  174360          CMP     #0,ANS4         ;CHECK FORTH
004430  001401                          BEQ     .+4
004432  104010                          HLT+8.                  ;FORTH # 0

004434  022767  000000  174350          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
004442  001401                          BEQ     .+4
004444  104010                          HLT+8.                  ;FIRST # 0

004446  022767  000000  174340          CMP     #0,ANS6         ;CHECK SECOND WORD
004454  001401                          BEQ     .+4
004456  104010                          HLT+8.                  ;SECOND # 0

004460  022767  000000  174330          CMP     #0,ANS7         ;CHECK THIRD WORD
004466  001401                          BEQ     .+4
004470  104010                          HLT+8.                  ;THIRD # 0

004472  022767  000000  174320          CMP     #0,ANS8         ;CHECK FORTH WORD
004500  001401                          BEQ     .+4
004502  104010                          HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 25                TEST OF MODD FPU INSTRUCTION
                                ;       40200 0 0 0 * 0 0 0 0 =
                                ;       0 0 0 0 & 0 0 0 0
                                ;       USING AC0       FPS = 47604     FEC = N/A
                                ;*****************************************************************
004504  104400                          SCOPE
004506  170127  047600                  LDFPS   #47604&57760
004512  172467  000030                  LDD     N25,0           ;LOAD 40200 INTO AC0
004516  171467  000034                  MODD    M25,0           ;MODIFY 40200 BY 0
004522  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
004524  022700  047604                  CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
004530  001401                          BEQ     .+4             ;BRANCH IF OK
004532  104000                          HLT                     ;FPS NOT EQUAL TO 47604

004534  174067  174242                  STD     0,ANS1          ;STORE FRACTIONAL PART
004540  174167  174246                  STD     0!1,ANS5        ;STORE INTERGER PART
004544  000410                          BR      025

004546  040200  000000  000000  N25:    40200,0,0,0
004554  000000
004556  000000  000000  000000  M25:    0,0,0,0
004564  000000
004566  022767  000000  174206  025:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
004574  001401                          BEQ     .+4
004576  104010                          HLT+8.                  ;FIRST # 0

004600  022767  000000  174176          CMP     #0,ANS2         ;CHECK SECOND WORD
004606  001401                          BEQ     .+4
004610  104010                          HLT+8.                  ;SECOND # 0

004612  022767  000000  174166          CMP     #0,ANS3         ;CHECK THIRD WORD
004620  001401                          BEQ     .+4
004622  104010                          HLT+8.                  ;THIRD # 0

004624  022767  000000  174156          CMP     #0,ANS4         ;CHECK FORTH
004632  001401                          BEQ     .+4
004634  104010                          HLT+8.                  ;FORTH # 0

004636  022767  000000  174146          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
004644  001401                          BEQ     .+4
004646  104010                          HLT+8.                  ;FIRST # 0

004650  022767  000000  174136          CMP     #0,ANS6         ;CHECK SECOND WORD
004656  001401                          BEQ     .+4
004660  104010                          HLT+8.                  ;SECOND # 0

004662  022767  000000  174126          CMP     #0,ANS7         ;CHECK THIRD WORD
004670  001401                          BEQ     .+4
004672  104010                          HLT+8.                  ;THIRD # 0

004674  022767  000000  174116          CMP     #0,ANS8         ;CHECK FORTH WORD
004702  001401                          BEQ     .+4
004704  104010                          HLT+8.                  ;FORTH # 0
```

```
                                        ;*****************************************************************
                                        ;TEST 26                TEST OF MODD FPU INSTRUCTION
                                        ;       40200 0 0 0 * 40200 0 0 0 =
                                        ;       40200 0 0 0 & 0 0 0 0
                                        ;       USING AC0       FPS = 47604     FEC = N/A
                                        ;*****************************************************************
004706  104400                          SCOPE
004710  170127  047600                  LDFPS   #47604&57760
004714  172467  000030                  LDD     N26.0           ;LOAD 40200 INTO AC0
004720  171467  000034                  MODD    M26.0           ;MODIFY 40200 BY 40200
004724  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
004726  022700  047604                  CMP     #47604.FPS      ;CHECK FLOATING POINT STATUS
004732  001401                          BEQ     .+4             ;BRANCH IF OK
004734  104000                          HLT                     ;FPS NOT EQUAL TO 47604

004736  174067  174040                  STD     0,ANS1          ;STORE FRACTIONAL PART
004742  174167  174044                  STD     0!1,ANS5        ;STORE INTERGER PART
004746  000410                          BR      D26

004750  040200  000000  000000  N26:    40200.0.0.0
004756  000000
004760  040200  000000  000030  M26:    40200.0.0.3
004766  000000
004770  022767  000000  174004  D26:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
004776  001401                          BEQ     .+4
005000  104010                          HLT+8.                  ;FIRST # 0

005002  022767  000000  173774          CMP     #0,ANS2         ;CHECK SECOND WORD
005010  001401                          BEQ     .+4
005012  104010                          HLT+8.                  ;SECOND # 0

005014  022767  000000  173764          CMP     #0,ANS3         ;CHECK THIRD WORD
005022  001401                          BEQ     .+4
005024  104010                          HLT+8.                  ;THIRD # 0

005026  022767  000000  173754          CMP     #0,ANS4         ;CHECK FORTH
005034  001401                          BEQ     .+4
005036  104010                          HLT+8.                  ;FORTH # 0

005040  022767  040200  173744          CMP     #40200.ANS5     ;CHECK FIRST WORD OF INTEGER
005046  001401                          BEQ     .+4
005050  104010                          HLT+8.                  ;FIRST # 40200

005052  022767  000000  173734          CMP     #0,ANS6         ;CHECK SECOND WORD
005060  001401                          BEQ     .+4
005062  104010                          HLT+8.                  ;SECOND # 0

005064  022767  000000  173724          CMP     #0,ANS7         ;CHECK THIRD WORD
005072  001401                          BEQ     .+4
005074  104010                          HLT+8.                  ;THIRD # 0

005076  022767  000000  173714          CMP     #0 ANS8         ;CHECK FORTH WORD
005104  001401                          BEQ     .+4
005106  104010                          HLT+8.                  ;FORTH # 0
```

```
                                        ;*****************************************************************
                                        ;TEST 27                TEST OF MODD FPU INSTRUCTION
                                        ;       40214 146314 146314 146315 * 40200 0 0 0 =
                                        ;       40200 0 0 0 & 37314 146314 146314 146320
                                        ;       USING AC0       FPS = 47600     FEC = N/A
                                        ;*****************************************************************
005110  104400                          SCOPE
005112  170127  047600                  LDFPS   #47600&57760
005116  172467  000030                  LDD     N27,0           ;LOAD 40214 INTO AC0
005122  171467  000034                  MODD    M27,0           ;MODIFY 40214 BY 40200
005126  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
005130  022700  047600                  CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
005134  001401                          BEQ     .+4             ;BRANCH IF OK
005136  104000                          HLT                     ;FPS NOT EQUAL TO 47600

005140  174067  173636                  STD     0,ANS1          ;STORE FRACTIONAL PART
005144  174167  173642                  STD     0!1,ANS5        ;STORE INTERGER PART
005150  000410                          BR      027

005152  040214  146314  146314  N27:    40214,146314,146314,146315
005160  146315
005162  040200  000000  000000  M27:    40200,0,0,0
005170  000000
005172  022767  037314  173602  027:    CMP     #37314,ANS1     ;CHECK FIRST WORD OF FRACTION
005200  001401                          BEQ     .+4
005202  104010                          HLT+8.                  ;FIRST # 37314

005204  022767  146314  173572          CMP     #146314,ANS2    ;CHECK SECOND WORD
005212  001401                          BEQ     .+4
005214  104010                          HLT+8.                  ;SECOND # 146314

005216  022767  146314  173562          CMP     #146314,ANS3    ;CHECK THIRD WORD
005224  001401                          BEQ     .+4
005226  104010                          HLT+8.                  ;THIRD # 146314

005230  022767  146320  173552          CMP     #146320,ANS4    ;CHECK FORTH
005236  001401                          BEQ     .+4
005240  104010                          HLT+8.                  ;FORTH # 146320

005242  022767  040200  173542          CMP     #40200,ANS5     ;CHECK FIRST WORD OF INTEGER
005250  001401                          BEQ     .+4
005252  104010                          HLT+8.                  ;FIRST # 40200

005254  022767  000000  173532          CMP     #0,ANS6         ;CHECK SECOND WORD
005262  001401                          BEQ     .+4
005264  104010                          HLT+8.                  ;SECOND # 0

005266  022767  000000  173522          CMP     #0,ANS7         ;CHECK THIRD WORD
005274  001401                          BEQ     .+4
005276  104010                          HLT+8.                  ;THIRD # 0

005300  022767  000000  173512          CMP     #0,ANS8         ;CHECK FORTH WORD
005306  001401                          BEQ     .+4
005310  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 30                TEST OF MODD FPU INSTRUCTION
                        ;       40414 146314 146314 146315 * 40200 0 0 0 =
                        ;       40400 0 0 0 & 37514 146314 146314 146320
                        ;       USING AC0       FPS = 47600     FEC = N/A
                        ;*****************************************************************
005312  104400                    SCOPE
005314  170127  047600            LDFPS   #47600&57760
005320  172467  000030            LDD     N30,0           ;LOAD 40414 INTO AC0
005324  171467  000034            MODD    M30,0           ;MODIFY 40414 BY 40200
005330  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
005332  022700  047600            CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
005336  001401                    BEQ     .+4             ;BRANCH IF OK
005340  104000                    HLT                     ;FPS NOT EQUAL TO 47600

005342  174067  173434            STD     0,ANS1          ;STORE FRACTIONAL PART
005346  174167  173440            STD     1,ANS5          ;STORE INTERGER PART
005352  000410                    BR      O3O

005354  040414  146314  146314  N30:    40414,146314,146314,146315
005362  146315
005364  040200  000000  000000  M30:    40200,0,0,0
005372  000000
005374  022767  037514  173400  O3O:    CMP     #37514,ANS1     ;CHECK FIRST WORD OF FRACTION
005402  001401                    BEQ     .+4
005404  104010                    HLT+8.                  ;FIRST # 37514

005406  022767  146314  173370            CMP     #146314,ANS2    ;CHECK SECOND WORD
005414  001401                    BEQ     .+4
005416  104010                    HLT+8.                  ;SECOND # 146314

005420  022767  146314  173360            CMP     #146314,ANS3    ;CHECK THIRD WORD
005426  001401                    BEQ     .+4
005430  104010                    HLT+8.                  ;THIRD # 146314

005432  022767  146320  173350            CMP     #146320,ANS4    ;CHECK FORTH
005440  001401                    BEQ     .+4
005442  104010                    HLT+8.                  ;FORTH # 146320

005444  022767  040400  173340            CMP     #40400,ANS5     ;CHECK FIRST WORD OF INTEGER
005452  001401                    BEQ     .+4
005454  104010                    HLT+8.                  ;FIRST # 40400

005456  022767  000000  173330            CMP     #0,ANS6         ;CHECK SECOND WORD
005464  001401                    BEQ     .+4
005466  104010                    HLT+8.                  ;SECOND # 0

005470  022767  000000  173320            CMP     #0,ANS7         ;CHECK THIRD WORD
005476  001401                    BEQ     .+4
005500  104010                    HLT+8.                  ;THIRD # 0

005502  022767  000000  173310            CMP     #0,ANS8         ;CHECK FORTH WORD
005510  001401                    BEQ     .+4
005512  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 31                TEST OF MODD FPU INSTRUCTION
                        ;       40523 31463 31463 31463 * 40200 0 0 0 =
                        ;       40500 0 0 0 & 37631 114631 114631 114630
                        ;       USING AC0       FPS = 47600     FEC = N/A
                        ;*****************************************************************
005514  104400                    SCOPE
005516  170127  047600            LDFPS   #47600&57760
005522  172467  000030            LDD     N31,0           ;LOAD 40523 INTO AC0
005526  171467  000034            MODD    M31,0           ;MODIFY 40523 BY 40200
005532  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
005534  022700  047600            CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
005540  001401                    BEQ     .+4             ;BRANCH IF OK
005542  104000                    HLT                     ;FPS NOT EQUAL TO 47600

005544  174067  173232            STD     0,ANS1          ;STORE FRACTIONAL PART
005550  174167  173236            STD     0!1,ANS5        ;STORE INTERGER PART
005554  000410                    BR      031

005556  040523  031463  031463  N31:    40523,31463,31463,31463
005564  031463
005566  040200  000000  000000  M31:    40200,0,0,0
005574  000000
005576  022767  037631  173176  031:    CMP     #37631,ANS1     ;CHECK FIRST WORD OF FRACTION
005604  001401                    BEQ     .+4
005606  104010                    HLT+8.                  ;FIRST # 37631

005610  022767  114631  173166            CMP     #114631,ANS2    ;CHECK SECOND WORD
005616  001401                    BEQ     .+4
005620  104010                    HLT+8.                  ;SECOND # 114631

005622  022767  114631  173156            CMP     #114631,ANS3    ;CHECK THIRD WORD
005630  001401                    BEQ     .+4
005632  104010                    HLT+8.                  ;THIRD # 114631

005634  022767  114630  173146            CMP     #114630,ANS4    ;CHECK FORTH
005642  001401                    BEQ     .+4
005644  104010                    HLT+8.                  ;FORTH # 114630

005646  022767  040500  173136            CMP     #40500,ANS5     ;CHECK FIRST WORD OF INTEGER
005654  001401                    BEQ     .+4
005656  104010                    HLT+8.                  ;FIRST # 40500

005660  022767  000000  173126            CMP     #0,ANS6         ;CHECK SECOND WORD
005666  001401                    BEQ     .+4
005670  104010                    HLT+8.                  ;SECOND # 0

005672  022767  000000  173116            CMP     #0,ANS7         ;CHECK THIRD WORD
005700  001401                    BEQ     .+4
005702  104010                    HLT+8.                  ;THIRD # 0

005704  022767  000000  173106            CMP     #0,ANS8         ;CHECK FORTH WORD
005712  001401                    BEQ     .+4
005714  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 32                TEST OF MODD FPU INSTRUCTION
                        ;       40660 0 0 0 * 40200 0 0 0 =
                        ;       40640 0 0 0 & 40000 0 0 0
                        ;       USING AC0       FPS = 47600     FEC = N/A
                        ;*****************************************************************
005716  104400                    SCOPE
005720  170127  047600            LDFPS   #47600&57760
005724  172467  000030            LDD     N32,0           ;LOAD 40660 INTO AC0
005730  171467  000034            MODD    M32,0           ;MODIFY 40660 BY 40200
005734  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
005736  022700  047600            CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
005742  001401                    BEQ     .+4             ;BRANCH IF OK
005744  104000                    HLT                     ;FPS NOT EQUAL TO 47600

005746  174067  173030            STD     0,ANS1          ;STORE FRACTIONAL PART
005752  174167  173034            STD     0!1,ANS5        ;STORE INTERGER PART
005756  000410                    BR      032

005760  040660  000000  000000  N32:    40660,0,0,0
005766  000000
005770  040200  000000  000000  M32:    40200,0,0,0
005776  000000
006000  022767  040000  172774  032:    CMP     #40000,ANS1     ;CHECK FIRST WORD OF FRACTION
006006  001401                    BEQ     .+4
006010  104010                    HLT+8.                  ;FIRST # 40000

006012  022767  000000  172764            CMP     #0,ANS2         ;CHECK SECOND WORD
006020  001401                    BEQ     .+4
006022  104010                    HLT+8.                  ;SECOND # 0

006024  022767  000000  172754            CMP     #0,ANS3         ;CHECK THIRD WORD
006032  001401                    BEQ     .+4
006034  104010                    HLT+8.                  ;THIRD # 0

006036  022767  000000  172744            CMP     #0,ANS4         ;CHECK FORTH
006044  001401                    BEQ     .+4
006046  104010                    HLT+8.                  ;FORTH # 0

006050  022767  040640  172734            CMP     #40640,ANS5     ;CHECK FIRST WORD OF INTEGER
006056  001401                    BEQ     .+4
006060  104010                    HLT+8.                  ;FIRST # 40640

006062  022767  000000  172724            CMP     #0,ANS6         ;CHECK SECOND WORD
006070  001401                    BEQ     .+4
006072  104010                    HLT+8.                  ;SECOND # 0

006074  022767  000000  172714            CMP     #0,ANS7         ;CHECK THIRD WORD
006102  001401                    BEQ     .+4
006104  104010                    HLT+8.                  ;THIRD # 0

006106  022767  000000  172704            CMP     #0,ANS8         ;CHECK FORTH WORD
006114  001401                    BEQ     .+4
006116  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 33                TEST OF MODD FPU INSTRUCTION
                        ;       140200 0 0 0 * 40200 0 0 0 =
                        ;       140200 0 0 0 & 0 0 0 0
                        ;       USING AC0       FPS = 47604     FEC = N/A
                        ;*****************************************************************
006120  104400                  SCOPE
006122  170127  047600          LDFPS   #47604&57760
006126  172467  000030          LDD     N33,0           ;LOAD 140200 INTO AC0
006132  171467  000034          MODD    M33,0           ;MODIFY 140200 BY 40200
006136  170200                  STFPS   FPS             ;STORE FLOATING POINT STATUS
006140  022700  047604          CMP     #47604,FPS      ;CHECK FLOATING POINT STATJS
006144  001401                  BEQ     .+4             ;BRANCH IF OK
006146  104000                  HLT                     ;FPS NOT EQUAL TO 47604

006150  174067  172626          STD     0,ANS1          ;STORE FRACTIONAL PART
006154  174167  172632          STD     0!1,ANS5        ;STORE INTERGER PART
006160  000410                  BR      033

006162  140200  000000  000000  N33:    140200,0,0,0
006170  000000
006172  040200  000000  000000  M33:    40200,0,0,0
006200  000000
006202  022767  000000  172572  033:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
006210  001401                  BEQ     .+4
006212  104010                  HLT+8.                  ;FIRST # 0

006214  022767  000000  172562          CMP     #0,ANS2         ;CHECK SECOND WORD
006222  001401                  BEQ     .+4
006224  104010                  HLT+8.                  ;SECOND # 0

006226  022767  000000  172552          CMP     #0,ANS3         ;CHECK THIRD WORD
006234  001401                  BEQ     .+4
006236  104010                  HLT+8.                  ;THIRD # 0

006240  022767  000000  172542          CMP     #0,ANS4         ;CHECK FORTH
006246  001401                  BEQ     .+4
006250  104010                  HLT+8.                  ;FORTH # 0

006252  022767  140200  172532          CMP     #140200,ANS5    ;CHECK FIRST WORD OF INTEGER
006260  001401                  BEQ     .+4
006262  104010                  HLT+8.                  ;FIRST # 140200

006264  022767  000000  172522          CMP     #0,ANS6         ;CHECK SECOND WORD
006272  001401                  BEQ     .+4
006274  104010                  HLT+8.                  ;SECOND # 0

006276  022767  000000  172512          CMP     #0,ANS7         ;CHECK THIRD WORD
006304  001401                  BEQ     .+4
006306  104010                  HLT+8.                  ;THIRD # 0

006310  022767  000000  172502          CMP     #0,ANS8         ;CHECK FORTH WORD
006316  001401                  BEQ     .+4
006320  104010                  HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 34                TEST OF MODD FPU INSTRUCTION
                                ;       140214 146314 146314 146315 * 40200 0 0 0 =
                                ;       140200 0 0 0 & 137314 146314 146314 146320
                                ;       USING AC0       FPS = 47610     FEC = N/A
                                ;*****************************************************************
006322  104400                          SCOPE
006324  170127  047600                  LDFPS   #47610&57760
006330  172467  000030                  LDD     N34,0           ;LOAD 140214 INTO AC0
006334  171467  000034                  MODD    M34,0           ;MODIFY 140214 BY 40200
006340  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
006342  022700  047610                  CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
006346  001401                          BEQ     .+4             ;BRANCH IF OK
006350  104000                          HLT                     ;FPS NOT EQUAL TO 47610

006352  174067  172424                  STD     0,ANS1          ;STORE FRACTIONAL PART
006356  174167  172430                  STD     0!1,ANS5        ;STORE INTERGER PART
006362  000410                          BR      034

006364  140214  146314  146314  N34:    140214,146314,146314,146315
006372  146315
006374  040200  000000  000000  M34:    40200,0,0,0
006402  000000
006404  022767  137314  172370  034:    CMP     #137314,ANS1    ;CHECK FIRST WORD OF FRACTION
006412  001401                          BEQ     .+4
006414  104010                          HLT+8.                  ;FIRST # 137314

006416  022767  146314  172360          CMP     #146314,ANS2    ;CHECK SECOND WORD
006424  001401                          BEQ     .+4
006426  104010                          HLT+8.                  ;SECOND # 146314

006430  022767  146314  172350          CMP     #146314,ANS3    ;CHECK THIRD WORD
006436  001401                          BEQ     .+4
006440  104010                          HLT+8.                  ;THIRD # 146314

006442  022767  146320  172340          CMP     #146320,ANS4    ;CHECK FORTH
006450  001401                          BEQ     .+4
006452  104010                          HLT+8.                  ;FORTH # 146320

006454  022767  140200  172330          CMP     #140200,ANS5    ;CHECK FIRST WORD OF INTEGER
006462  001401                          BEQ     .+4
006464  104010                          HLT+8.                  ;FIRST # 140200

006466  022767  000000  172320          CMP     #0,ANS6         ;CHECK SECOND WORD
006474  001401                          BEQ     .+4
006476  104010                          HLT+8.                  ;SECOND # 0

006500  022767  000000  172310          CMP     #0,ANS7         ;CHECK THIRD WORD
006506  001401                          BEQ     .+4
006510  104010                          HLT+8.                  ;THIRD # 0

006512  022767  000000  172300          CMP     #0,ANS8         ;CHECK FORTH WORD
006520  001401                          BEQ     .+4
006522  104010                          HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 35                TEST OF MODD FPU INSTRUCTION
                                ;       140414 146314 146314 146315 * 40200 0 0 0 =
                                ;       140400 0 0 0 & 137514 146314 146314 146320
                                ;       USING AC0       FPS = 47610     FEC = N/A
                                ;*****************************************************************
006524  104400                          SCOPE
006526  170127  047600                  LDFPS   #47610&57760
006532  172467  000030                  LDD     N35,0           ;LOAD 140414 INTO AC0
006536  171467  000034                  MODD    M35,0           ;MODIFY 140414 BY 40200
006542  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
006544  022700  047610                  CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
006550  001401                          BEQ     .+4             ;BRANCH IF OK
006552  104000                          HLT                     ;FPS NOT EQUAL TO 47610

006554  174067  172222                  STD     0,ANS1          ;STORE FRACTIONAL PART
006560  174167  172226                  STD     0!1,ANS5        ;STORE INTERGER PART
006564  000410                          BR      035

006566  140414  146314  146314  N35:    140414,146314,146314,146315
006574  146315
006576  040200  000000  000000  M35:    40200,0,0,0
006604  000000
006606  022767  137514  172166  035:    CMP     #137514,ANS1    ;CHECK FIRST WORD OF FRACTION
006614  001401                          BEQ     .+4
006616  104010                          HLT+8.                  ;FIRST # 137514

006620  022767  146314  172156          CMP     #146314,ANS2    ;CHECK SECOND WORD
006626  001401                          BEQ     .+4
006630  104010                          HLT+8.                  ;SECOND # 146314

006632  022767  146314  172146          CMP     #146314,ANS3    ;CHECK THIRD WORD
006640  001401                          BEQ     .+4
006642  104010                          HLT+8.                  ;THIRD # 146314

006644  022767  146320  172136          CMP     #146320,ANS4    ;CHECK FORTH
006652  001401                          BEQ     .+4
006654  104010                          HLT+8.                  ;FORTH # 146320

006656  022767  140400  172126          CMP     #140400,ANS5    ;CHECK FIRST WORD OF INTEGER
006664  001401                          BEQ     .+4
006666  104010                          HLT+8.                  ;FIRST # 140400

006670  022767  000000  172116          CMP     #0,ANS6         ;CHECK SECOND WORD
006676  001401                          BEQ     .+4
006700  104010                          HLT+8.                  ;SECOND # 0

006702  022767  000000  172106          CMP     #0,ANS7         ;CHECK THIRD WORD
006710  001401                          BEQ     .+4
006712  104010                          HLT+8.                  ;THIRD # 0

006714  022767  000000  172076          CMP     #0,ANS8         ;CHECK FORTH WORD
006722  001401                          BEQ     .+4
006724  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 36                TEST OF MODD FPU INSTRUCTION
                        ;       140523 31463 31463 31463 * 40200 0 0 0 =
                        ;       140500 0 0 0 & 137631 114631 114631 114630
                        ;       USING ACO       FPS = 47610     FEC = N/A
                        ;*****************************************************************
                                SCOPE
                                SETFPS  #47610&5777
                                CLO     #36.0           ;LOAD 140523 INTO AC0
                                MODD    #36.0           ;MODIFY 140523 BY 40200
                                STFPS   FPS             ;STORE FLOATING POINT STATUS
                                CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
                                BEQ     .+4             ;BRANCH IF OK
                                HLT                     ;FPS NOT EQUAL TO 47610

                                STD     0,ANS1          ;STORE FRACTIONAL PART
                                STD     0!1,ANS5        ;STORE INTEGER PART
                                BR      C36

006770  140523  031463  031463  #36:    140523,31463,31463,31463
006776  031463
007000  040200  000000  000000  #36:    40200,0,0,0
007006  000000
007010  022767  137631  171764  C36:    CMP     #137631,ANS1    ;CHECK FIRST WORD OF FRACTION
007016  001401                          BEQ     .+4
007020  104010                          HLT+8.                  ;FIRST # 137631

007022  022767  114631  171754          CMP     #114631,ANS2    ;CHECK SECOND WORD
007030  001401                          BEQ     .+4
007032  104010                          HLT+8.                  ;SECOND # 114631

007034  022767  114631  171744          CMP     #114631,ANS3    ;CHECK THIRD WORD
007042  001401                          BEQ     .+4
007044  104010                          HLT+8.                  ;THIRD # 114631

007046  022767  114630  171734          CMP     #114630,ANS4    ;CHECK FORTH
007054  001401                          BEQ     .+4
007056  104010                          HLT+8.                  ;FORTH # 114630

007060  022767  140500  171724          CMP     #140500,ANS5    ;CHECK FIRST WORD OF INTEGER
007066  001401                          BEQ     .+4
007070  104010                          HLT+8.                  ;FIRST # 140500

007072  022767  000000  171714          CMP     #0,ANS6         ;CHECK SECOND WORD
007100  001401                          BEQ     .+4
007102  104010                          HLT+8.                  ;SECOND # 0

007104  022767  000000  171704          CMP     #0,ANS7         ;CHECK THIRD WORD
007112  001401                          BEQ     .+4
007114  104010                          HLT+8.                  ;THIRD # 0

007116  022767  000000  171674          CMP     #0,ANS8         ;CHECK FORTH WORD
007124  001401                          BEQ     .+4
007126  104010                          HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 37                TEST OF MODD FPU INSTRUCTION
                                ;       140660 0 0 0 * 40200 0 0 0 =
                                ;       140640 0 0 0 & 140000 0 0 0
                                ;       USING AC0       FPS = 47610     FEC = N/A
                                ;*****************************************************************
007130  104400                          SCOPE
007132  170127  047600                  LDFPS   #47610,#57760
007136  172467  000030                  LDD     N37,0           ;LOAD 140660 INTO AC0
007142  171467  000034                  MODD    M37,0           ;MODIFY 140660 BY 40200
007146  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
007150  022700  047610                  CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
007154  001401                          BEQ     .+4             ;BRANCH IF OK
007156  104000                          HLT                     ;FPS NOT EQUAL TO 47610

007160  174067  171616                  STD     0,ANS1          ;STORE FRACTIONAL PART
007164  174167  171622                  STD     0!1,ANS5        ;STORE INTERGER PART
007170  000410                          BR      037

007172  140660  000000  000000  N37:    140660,0,0,0
007200  000000
007202  040200  000000  000000  M37:    40200,0,0,0
007210  000000
007212  022767  140000  171562  037:    CMP     #140000,ANS1    ;CHECK FIRST WORD OF FRACTION
007220  001401                          BEQ     .+4
007222  104010                          HLT+8.                  ;FIRST # 140000

007224  022767  000000  171552          CMP     #0,ANS2         ;CHECK SECOND WORD
007232  001401                          BEQ     .+4
007234  104010                          HLT+8.                  ;SECOND # 0

007236  022767  000000  171542          CMP     #0,ANS3         ;CHECK THIRD WORD
007244  001401                          BEQ     .+4
007246  104010                          HLT+8.                  ;THIRD # 0

007250  022767  000000  171532          CMP     #0,ANS4         ;CHECK FORTH
007256  001401                          BEQ     .+4
007260  104010                          HLT+8.                  ;FORTH # 0

007262  022767  140640  171522          CMP     #140640,ANS5    ;CHECK FIRST WORD OF INTEGER
007270  001401                          BEQ     .+4
007272  104010                          HLT+8.                  ;FIRST # 140640

007274  022767  000000  171512          CMP     #0,ANS6         ;CHECK SECOND WORD
007302  001401                          BEQ     .+4
007304  104010                          HLT+8.                  ;SECOND # 0

007306  022767  000000  171502          CMP     #0,ANS7         ;CHECK THIRD WORD
007314  001401                          BEQ     .+4
007316  104010                          HLT+6.                  ;THIRD # 0

007320  022767  000000  171472          CMP     #0,ANS8         ;CHECK FORTH WORD
007326  001401                          BEQ     .+4
007330  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 40                TEST OF MODD FPU INSTRUCTION
                        ;       52525 52525 52525 52525 * 40200 0 0 0 =
                        ;       52525 52525 52525 40000 & 37652 124000 0 0
                        ;       USING AC0       FPS = 47600     FEC = N/A
                        ;*****************************************************************
007332  104400                        SCOPE
007334  170127  047600                LDFPS   #47600&57760
007340  172467  000030                LDD     N40,0           ;LOAD 52525 INTO AC0
007344  171467  000034                MODD    M40,0           ;MODIFY 52525 BY 40200
007350  170200                        STFPS   FPS             ;STORE FLOATING POINT STATUS
007352  022700  047600                CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
007356  001401                        BEQ     .+4             ;BRANCH IF OK
007360  104000                        HLT                     ;FPS NOT EQUAL TO 47600

007362  174067  171414                STD     0,ANS1          ;STORE FRACTIONAL PART
007366  174167  171420                STD     0!1,ANS5        ;STORE INTEGER PART
007372  000410                        BR      040

007374  052525  052525  052525  N40:  52525,52525,52525,52525
007402  052525
007404  040200  000000  000000  M40:  40200,0,0,0
007412  000000
007414  022767  037652  171360  040:  CMP     #37652,ANS1     ;CHECK FIRST WORD OF FRACTION
007422  001401                        BEQ     .+4
007424  104010                        HLT+8.                  ;FIRST # 37652

007426  022767  124000  171350        CMP     #124000,ANS2    ;CHECK SECOND WORD
007434  001401                        BEQ     .+4
007436  104010                        HLT+8.                  ;SECOND # 124000

007440  022767  000000  171340        CMP     #0,ANS3         ;CHECK THIRD WORD
007446  001401                        BEQ     .+4
007450  104010                        HLT+8.                  ;THIRD # 0

007452  022767  000000  171330        CMP     #0,ANS4         ;CHECK FORTH
007460  001401                        BEQ     .+4
007462  104010                        HLT+8.                  ;FORTH # 0

007464  022767  052525  171320        CMP     #52525,ANS5     ;CHECK FIRST WORD OF INTEGER
007472  001401                        BEQ     .+4
007474  104010                        HLT+8.                  ;FIRST # 52525

007476  022767  052525  171310        CMP     #52525,ANS6     ;CHECK SECOND WORD
007504  001401                        BEQ     .+4
007506  104010                        HLT+8.                  ;SECOND # 52525

007510  022767  052525  171300        CMP     #52525,ANS7     ;CHECK THIRD WORD
007516  001401                        BEQ     .+4
007520  104010                        HLT+8.                  ;THIRD # 52525

007522  022767  040000  171270        CMP     #40000,ANS8     ;CHECK FORTH WORD
007530  001401                        BEQ     .+4
007532  104010                        HLT+8.                  ;FORTH # 40000
```

```
                                ;*****************************************************************
                                ;TEST 41                TEST OF MODD FPU INSTRUCTION
                                ;       125252 125252 125252 125252 * 40200 0 0 0 =
                                ;       0 0 0 0 & 125252 125252 125252 125252
                                ;       USING AC0       FPS = 47610     FEC = N/A
                                ;*****************************************************************
007534  104400                          SCOPE
007536  170127  047600                  LDFPS   #47610&57760
007542  172467  000030                  LDD     N41,0           ;LOAD 125252 INTO AC0
007546  171467  000034                  MODD    N41,0           ;MODIFY 125252 BY 40200
007552  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
007554  022700  047610                  CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
007560  001401                          BEQ     .+4             ;BRANCH IF OK
007562  104000                          HLT                     ;FPS NOT EQUAL TO 47610

007564  174067  171212                  STD     0,ANS1          ;STORE FRACTIONAL PART
007570  174167  171216                  STD     0!1,ANS5        ;STORE INTERGER PART
007574  000410                          BR      041

007576  125252  125252  125252  N41:    125252,125252,125252,125252
007604  125252
007606  040200  000000  000000  M41:    40200,0,0,0
007614  000000
007616  022767  125252  171156  041:    CMP     #125252,ANS1    ;CHECK FIRST WORD OF FRACTION
007624  001401                          BEQ     .+4
007626  104010                          HLT+8.                  ;FIRST # 125252

007630  022767  125252  171146          CMP     #125252,ANS2    ;CHECK SECOND WORD
007636  001401                          BEQ     .+4
007640  104010                          HLT+8.                  ;SECOND # 125252

007642  022767  125252  171136          CMP     #125252,ANS3    ;CHECK THIRD WORD
007650  001401                          BEQ     .+4
007652  104010                          HLT+8.                  ;THIRD # 125252

007654  022767  125252  171126          CMP     #125252,ANS4    ;CHECK FORTH
007662  001401                          BEQ     .+4
007664  104010                          HLT+8.                  ;FORTH # 125252

007666  022767  000000  171116          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
007674  001401                          BEQ     .+4
007676  104010                          HLT+8.                  ;FIRST # 0

007700  022767  000000  171106          CMP     #0,ANS6         ;CHECK SECOND WORD
007706  001401                          BEQ     .+4
007710  104010                          HLT+8.                  ;SECOND # 0

007712  022767  000000  171076          CMP     #0,ANS7         ;CHECK THIRD WORD
007720  001401                          BEQ     .+4
007722  104010                          HLT+8.                  ;THIRD # 0

007724  022767  000000  171066          CMP     #0,ANS8         ;CHECK FORTH WORD
007732  001401                          BEQ     .+4
007734  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 42                TEST OF MODD FPU INSTRUCTION
                        ;       0 0 0 0 * 0 0 0 0 =
                        ;       0 0 0 0 & 0 0 0 0
                        ;       USING AC2       FPS = 47604     FEC = N/A
                        ;*****************************************************************
007736  104400                    SCOPE
007740  170127  047600            LDFPS   #47604&57760
007744  172667  000030            LDD     N42,2           ;LOAD 0 INTO AC2
007750  171667  000034            MODD    M42,2           ;MODIFY 0 BY 0
007754  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
007756  022700  047604            CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
007762  001401                    BEQ     .+4             ;BRANCH IF OK
007764  104000                    HLT                     ;FPS NOT EQUAL TO 47604

007766  174267  171010            STD     2,ANS1          ;STORE FRACTIONAL PART
007772  174367  171014            STD     2!1,ANS5        ;STORE INTERGER PART
007776  000410                    BR      042

010000  000000  000000  000000  N42:    0.0.0.0
010006  000000
010010  000000  000000  000000  M42:    0.0.0.0
010016  000000
010020  022767  000000  170754  042:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
010026  001401                    BEQ     .+4
010030  104010                    HLT+8.                  ;FIRST # 0

010032  022767  000000  170744            CMP     #0,ANS2         ;CHECK SECOND WORD
010040  001401                    BEQ     .+4
010042  104010                    HLT+8.                  ;SECOND # 0

010044  022767  000000  170734            CMP     #0,ANS3         ;CHECK THIRD WORD
010052  001401                    BEQ     .+4
010054  104010                    HLT+8.                  ;THIRD # 0

010056  022767  000000  170724            CMP     #0,ANS4         ;CHECK FORTH
010064  001401                    BEQ     .+4
010066  104010                    HLT+8.                  ;FORTH # 0

010070  022767  000000  170714            CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
010076  001401                    BEQ     .+4
010100  104010                    HLT+8.                  ;FIRST # 0

010102  022767  000000  170704            CMP     #0,ANS6         ;CHECK SECOND WORD
010110  001401                    BEQ     .+4
010112  104010                    HLT+8.                  ;SECOND # 0

010114  022767  000000  170674            CMP     #0,ANS7         ;CHECK THIRD WORD
010122  001401                    BEQ     .+4
010124  104010                    HLT+8.                  ;THIRD # 0

010126  022767  000000  170664            CMP     #0,ANS8         ;CHECK FORTH WORD
010134  001401                    BEQ     .+4
010136  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 43                TEST OF MODD FPU INSTRUCTION
                        ;       0 0 0 0 * 40200 0 0 0 =
                        ;       0 0 0 0 & 0 0 0 0
                        ;       USING AC2       FPS = 47604     FEC = N/A
                        ;*****************************************************************
010140  104400                  SCOPE
010142  170127  047600          LDFPS   #47604&57760
010146  172667  000030          LDD     N43,2           ;LOAD 0 INTO AC2
010152  171667  000034          MODD    M43,2           ;MODIFY 0 BY 40200
010156  170200                  STFPS   FPS             ;STORE FLOATING POINT STATUS
010160  022700  047604          CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
010164  001401                  BEQ     .+4             ;BRANCH IF OK
010166  104000                  HLT                     ;FPS NOT EQUAL TO 47604

010170  174267  170606          STD     2,ANS1          ;STORE FRACTIONAL PART
010174  174367  170612          STD     2!1,ANS5        ;STORE INTERGER PART
010200  000410                  BR      043

010202  000000  000000  000000  N43:    0.0.0.0
010210  000000
010212  040200  000000  000000  M43:    40200.0.0.0
010220  000000
010222  022767  000000  170552  043:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
010230  001401                  BEQ     .+4
010232  104010                  HLT+8.                  ;FIRST # 0

010234  022767  000000  170542          CMP     #0,ANS2         ;CHECK SECOND WORD
010242  001401                  BEQ     .+4
010244  104010                  HLT+8.                  ;SECOND # 0

010246  022767  000000  170532          CMP     #0,ANS3         ;CHECK THIRD WORD
010254  001401                  BEQ     .+4
010256  104010                  HLT+8.                  ;THIRD # 0

010260  022767  000000  170522          CMP     #0,ANS4         ;CHECK FORTH
010266  001401                  BEQ     .+4
010270  104010                  HLT+8.                  ;FORTH # 0

010272  022767  000000  170512          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
010300  001401                  BEQ     .+4
010302  104010                  HLT+8.                  ;FIRST # 0

010304  022767  000000  170502          CMP     #0,ANS6         ;CHECK SECOND WORD
010312  001401                  BEQ     .+4
010314  104010                  HLT+8.                  ;SECOND # 0

010316  022767  000000  170472          CMP     #0,ANS7         ;CHECK THIRD WORD
010324  001401                  BEQ     .+4
010326  104010                  HLT+8.                  ;THIRD # 0

010330  022767  000000  170462          CMP     #0,ANS8         ;CHECK FORTH WORD
010336  001401                  BEQ     .+4
010340  104010                  HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 44                TEST OF MODD FPU INSTRUCTION
                                ;       40200 0 0 0 * 0 0 0 0 =
                                ;       0 0 0 0 & 0 0 0 0
                                ;       USING AC2       FPS = 47604     FEC = N/A
                                ;*****************************************************************
010342  104400                          SCOPE
010344  170127  047600                  LDFPS   #47604&57760
010350  172667  000030                  LDD     N44,2           ;LOAD 40200 INTO AC2
010354  171667  000034                  MODD    M44,2           ;MODIFY 40200 BY 0
010360  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
010362  022700  047604                  CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
010366  001401                          BEQ     .+4             ;BRANCH IF OK
010370  104000                          HLT                     ;FPS NOT EQUAL TO 47604

010372  174267  170404                  STD     2,ANS1          ;STORE FRACTIONAL PART
010376  174367  170410                  STD     2!1,ANS5        ;STORE INTERGER PART
010402  000410                          BR      044

010404  040200  000000  000000  N44:    40200,0,0,0
010412  000000
010414  000000  000000  000000  M44:    0,0,0,0
010422  000000
010424  022767  000000  170350  044:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
010432  001401                          BEQ     .+4
010434  104010                          HLT+8.                  ;FIRST # 0

010436  022767  000000  170340          CMP     #0,ANS2         ;CHECK SECOND WORD
010444  001401                          BEQ     .+4
010446  104010                          HLT+8.                  ;SECOND # 0

010450  022767  000000  170330          CMP     #0,ANS3         ;CHECK THIRD WORD
010456  001401                          BEQ     .+4
010460  104010                          HLT+8.                  ;THIRD # 0

010462  022767  000000  170320          CMP     #0,ANS4         ;CHECK FORTH
010470  001401                          BEQ     .+4
010472  104010                          HLT+8.                  ;FORTH # 0

010474  022767  000000  170310          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
010502  001401                          BEQ     .+4
010504  104010                          HLT+8.                  ;FIRST # 0

010506  022767  000000  170300          CMP     #0,ANS6         ;CHECK SECOND WORD
010514  001401                          BEQ     .+4
010516  104010                          HLT+8.                  ;SECOND # 0

010520  022767  000000  170270          CMP     #0,ANS7         ;CHECK THIRD WORD
010526  001401                          BEQ     .+4
010530  104010                          HLT+8.                  ;THIRD # 0

010532  022767  000000  170260          CMP     #0,ANS8         ;CHECK FORTH WORD
010540  001401                          BEQ     .+4
010542  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 45                TEST OF MODD FPU INSTRUCTION
                        ;       40200 0 0 0 * 40200 0 0 0 =
                        ;       40200 0 0 0 & 0 0 0 0
                        ;       USING AC2       FPS = 47604     FEC = N/A
                        ;*****************************************************************
010544  104400                  SCOPE
010546  170127  047600          LDFPS   #47604&57760
010552  172667  000030          LDD     N45,2           ;LOAD 40200 INTO AC2
010556  171667  000034          MODD    M45,2           ;MODIFY 40200 BY 40200
010562  170200                  STFPS   FPS             ;STORE FLOATING POINT STATUS
010564  022700  047604          CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
010570  001401                  BEQ     .+4             ;BRANCH IF OK
010572  104000                  HLT                     ;FPS NOT EQUAL TO 47604

010574  174267  170202          STD     2,ANS1          ;STORE FRACTIONAL PART
010600  174367  170206          STD     2!1,ANS5        ;STORE INTERGER PART
010604  000410                  BR      045

010606  040200  000000  000000  N45:    40200,0,0,0
010614  000000
010616  040200  000000  000000  M45:    40200,0,0,0
010624  000000
010626  022767  000000  170146  045:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
010634  001401                  BEQ     .+4
010636  104010                  HLT+8.                  ;FIRST # 0

010640  022767  000000  170136          CMP     #0,ANS2         ;CHECK SECOND WORD
010646  001401                  BEQ     .+4
010650  104010                  HLT+8.                  ;SECOND # 0

010652  022767  000000  170126          CMP     #0,ANS3         ;CHECK THIRD WORD
010660  001401                  BEQ     .+4
010662  104010                  HLT+8.                  ;THIRD # 0

010664  022767  000000  170116          CMP     #0,ANS4         ;CHECK FORTH
010672  001401                  BEQ     .+4
010674  104010                  HLT+8.                  ;FORTH # 0

010676  022767  040200  170106          CMP     #40200,ANS5     ;CHECK FIRST WORD OF INTEGER
010704  001401                  BEQ     .+4
010706  104010                  HLT+8.                  ;FIRST # 40200

010710  022767  000000  170076          CMP     #0,ANS6         ;CHECK SECOND WORD
010716  001401                  BEQ     .+4
010720  104010                  HLT+8.                  ;SECOND # 0

010722  022767  000000  170066          CMP     #0,ANS7         ;CHECK THIRD WORD
010730  001401                  BEQ     .+4
010732  104010                  HLT+8.                  ;THIRD # 0

010734  022767  000000  170056          CMP     #0,ANS8         ;CHECK FORTH WORD
010742  001401                  BEQ     .+4
010744  104010                  HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 46                TEST OF MODD FPU INSTRUCTION
                        ;       40214 146314 146314 146315 * 40200 0 0 0 =
                        ;       40200 0 0 0 & 37314 146314 146314 146320
                        ;       USING AC2       FPS = 47600     FEC = N/A
                        ;*****************************************************************
010746  104400                  SCOPE
010750  170127  047600          LDFPS   #47600&57760
010754  172667  000030          LDD     N46,2           ;LOAD 40214 INTO AC2
010760  171667  000034          MODD    M46,2           ;MODIFY 40214 BY 40200
010764  170200                  STFPS   FPS             ;STORE FLOATING POINT STATUS
010766  022700  047600          CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
010772  001401                  BEQ     .+4             ;BRANCH IF OK
010774  104000                  HLT                     ;FPS NOT EQUAL TO 47600

010776  174267  170000          STD     2,ANS1          ;STORE FRACTIONAL PART
011002  174367  170004          STD     2!1,ANS5        ;STORE INTERGER PART
011006  000410                  BR      046

011010  040214  146314  146314  N46:    40214,146314,146314,146315
011016  146315
011020  040200  000000  000000  M46:    40200,0,0,0
011026  000000
011030  022767  037314  167744  046:    CMP     #37314,ANS1     ;CHECK FIRST WORD OF FRACTION
011036  001401                  BEQ     .+4
011040  104010                  HLT+8.                  ;FIRST # 37314

011042  022767  146314  167734          CMP     #146314,ANS2    ;CHECK SECOND WORD
011050  001401                  BEQ     .+4
011052  104010                  HLT+8.                  ;SECOND # 146314

011054  022767  146314  167724          CMP     #146314,ANS3    ;CHECK THIRD WORD
011062  001401                  BEQ     .+4
011064  104010                  HLT+8.                  ;THIRD # 146314

011066  022767  146320  167714          CMP     #146320,ANS4    ;CHECK FORTH
011074  001401                  BEQ     .+4
011076  104010                  HLT+8.                  ;FORTH # 146320

011100  022767  040200  167704          CMP     #40200,ANS5     ;CHECK FIRST WORD OF INTEGER
011106  001401                  BEQ     .+4
011110  104010                  HLT+8.                  ;FIRST # 40200

011112  022767  000000  167674          CMP     #0,ANS6         ;CHECK SECOND WORD
011120  001401                  BEQ     .+4
011122  104010                  HLT+8.                  ;SECOND # 0

011124  022767  000000  167664          CMP     #0,ANS7         ;CHECK THIRD WORD
011132  001401                  BEQ     .+4
011134  104010                  HLT+8.                  ;THIRD # 0

011136  022767  000000  167654          CMP     #0,ANS8         ;CHECK FORTH WORD
011144  001401                  BEQ     .+4
011146  104010                  HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 47                TEST OF MODD FPU INSTRUCTION
                                ;       40414 146314 146314 146315 * 40200 0 0 0 =
                                ;       40400 0 0 0 & 37514 146314 146314 146320
                                ;       USING AC2       FPS = 47600     FEC = N/A
                                ;*****************************************************************
011150  104400                          SCOPE
011152  170127  047600                  LDFPS   #47600&57760
011156  172667  000030                  LDD     N47,2           ;LOAD 40414 INTO AC2
011162  171667  000034                  MODD    M47,2           ;MODIFY 40414 BY 40200
011166  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
011170  022700  047600                  CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
011174  001401                          BEQ     .+4             ;BRANCH IF OK
011176  104000                          HLT                     ;FPS NOT EQUAL TO 47600

011200  174267  167576                  STD     2,ANS1          ;STORE FRACTIONAL PART
011204  174367  167602                  STD     2!1,ANS5        ;STORE INTERGER PART
011210  000410                          BR      047

011212  040414  146314  146314  N47:    40414,146314,146314,146315
011220  146315
011222  040200  000000  000000  M47:    40200,0,0,0
011230  000000
011232  022767  037514  167542  047:    CMP     #37514,ANS1     ;CHECK FIRST WORD OF FRACTION
011240  001401                          BEQ     .+4
011242  104010                          HLT+8.                  ;FIRST # 37514

011244  022767  146314  167532          CMP     #146314,ANS2    ;CHECK SECOND WORD
011252  001401                          BEQ     .+4
011254  104010                          HLT+8.                  ;SECOND # 146314

011256  022767  146314  167522          CMP     #146314,ANS3    ;CHECK THIRD WORD
011264  001401                          BEQ     .+4
011266  104010                          HLT+8.                  ;THIRD # 146314

011270  022767  146320  167512          CMP     #146320,ANS4    ;CHECK FORTH
011276  001401                          BEQ     .+4
011300  104010                          HLT+8.                  ;FORTH # 146320

011302  022767  040400  167502          CMP     #40400,ANS5     ;CHECK FIRST WORD OF INTEGER
011310  001401                          BEQ     .+4
011312  104010                          HLT+8.                  ;FIRST # 40400

011314  022767  000000  167472          CMP     #0,ANS6         ;CHECK SECOND WORD
011322  001401                          BEQ     .+4
011324  104010                          HLT+8.                  ;SECOND # 0

011326  022767  000000  167462          CMP     #0,ANS7         ;CHECK THIRD WORD
011334  001401                          BEQ     .+4
011336  104010                          HLT+8.                  ;THIRD # 0

011340  022767  000000  167452          CMP     #0,ANS8         ;CHECK FORTH WORD
011346  001401                          BEQ     .+4
011350  104010                          HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 50                TEST OF MODD FPU INSTRUCTION
                                ;       40523 31463 31463 31463 * 40200 0 0 0 =
                                ;       40500 0 0 0 & 37631 114631 114631 114630
                                ;       USING AC2       FPS = 47600     FEC = N/A
                                ;*****************************************************************
011352  104400                          SCOPE
011354  170127  047600                  LDFPS   #47600&57760
011360  172667  000030                  LDD     N50,2           ;LOAD 40523 INTO AC2
011364  171667  000034                  MODD    M50,2           ;MODIFY 40523 BY 40200
011370  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
011372  022700  047600                  CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
011376  001401                          BEQ     .+4             ;BRANCH IF OK
011400  104000                          HLT                     ;FPS NOT EQUAL TO 47600

011402  174267  167374                  STD     2,ANS1          ;STORE FRACTIONAL PART
011406  174367  167400                  STD     2!1,ANS5        ;STORE INTERGER PART
011412  000410                          BR      050

011414  040523  031463  031463  N50:    40523,31463,31463,31463
011422  031463
011424  040200  000000  000000  M50:    40200,0,0,0
011432  000000
011434  022767  037631  167340  050:    CMP     #37631,ANS1     ;CHECK FIRST WORD OF FRACTION
011442  001401                          BEQ     .+4
011444  104010                          HLT+8.                  ;FIRST # 37631

011446  022767  114631  167330          CMP     #114631,ANS2    ;CHECK SECOND WORD
011454  001401                          BEQ     .+4
011456  104010                          HLT+8.                  ;SECOND # 114631

011460  022767  114631  167320          CMP     #114631,ANS3    ;CHECK THIRD WORD
011466  001401                          BEQ     .+4
011470  104010                          HLT+8.                  ;THIRD # 114631

011472  022767  114630  167310          CMP     #114630,ANS4    ;CHECK FORTH
011500  001401                          BEQ     .+4
011502  104010                          HLT+8.                  ;FORTH # 114630

011504  022767  040500  167300          CMP     #40500,ANS5     ;CHECK FIRST WORD OF INTEGER
011512  001401                          BEQ     .+4
011514  104010                          HLT+8.                  ;FIRST # 40500

011516  022767  000000  167270          CMP     #0,ANS6         ;CHECK SECOND WORD
011524  001401                          BEQ     .+4
011526  104010                          HLT+8.                  ;SECOND # 0

011530  022767  000000  167260          CMP     #0,ANS7         ;CHECK THIRD WORD
011536  001401                          BEQ     .+4
011540  104010                          HLT+8.                  ;THIRD # 0

011542  022767  000000  167250          CMP     #0,ANS8         ;CHECK FORTH WORD
011550  001401                          BEQ     .+4
011552  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 51                TEST OF MODD FPU INSTRUCTION
                        ;       40660 0 0 0 * 40200 0 0 0 =
                        ;       40640 0 0 0 & 40000 0 0 0
                        ;       USING AC2       FPS = 47600     FEC = N/A
                        ;*****************************************************************
011554  104400                    SCOPE
011556  170127  047600            LDFPS   #47600&57760
011562  172667  000030            LDD     N51,2           ;LOAD 40660 INTO AC2
011566  171667  000034            MODD    M51,2           ;MODIFY 40660 BY 40200
011572  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
011574  022700  047600            CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
011600  001401                    BEQ     .+4             ;BRANCH IF OK
011602  104000                    HLT                     ;FPS NOT EQUAL TO 47600

011604  174267  167172            STD     2,ANS1          ;STORE FRACTIONAL PART
011610  174367  167176            STD     2!1,ANS5        ;STORE INTERGER PART
011614  000410                    BR      051

011616  040660  000000  000000  N51:    40660,0,0,0
011624  000000
011626  040200  000000  000000  M51:    40200,0,0,0
011634  000000
011636  022767  040000  167136  051:    CMP     #40000,ANS1     ;CHECK FIRST WORD OF FRACTION
011644  001401                    BEQ     .+4
011646  104010                    HLT+8.                  ;FIRST # 40000

011650  022767  000000  167126          CMP     #0,ANS2         ;CHECK SECOND WORD
011656  001401                    BEQ     .+4
011660  104010                    HLT+8.                  ;SECOND # 0

011662  022767  000000  167116          CMP     #0,ANS3         ;CHECK THIRD WORD
011670  001401                    BEQ     .+4
011672  104010                    HLT+8.                  ;THIRD # 0

011674  022767  000000  167106          CMP     #0,ANS4         ;CHECK FORTH
011702  001401                    BEQ     .+4
011704  104010                    HLT+8.                  ;FORTH # 0

011706  022767  040640  167076          CMP     #40640,ANS5     ;CHECK FIRST WORD OF INTEGER
011714  001401                    BEQ     .+4
011716  104010                    HLT+8.                  ;FIRST # 40640

011720  022767  000000  167066          CMP     #0,ANS6         ;CHECK SECOND WORD
011726  001401                    BEQ     .+4
011730  104010                    HLT+8.                  ;SECOND # 0

011732  022767  000000  167056          CMP     #0,ANS7         ;CHECK THIRD WORD
011740  001401                    BEQ     .+4
011742  104010                    HLT+8.                  ;THIRD # 0

011744  022767  000000  167046          CMP     #0,ANS8         ;CHECK FORTH WORD
011752  001401                    BEQ     .+4
011754  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 52                TEST OF MODD FPU INSTRUCTION
                        ;       140200 0 0 0 * 40200 0 0 0 =
                        ;       140200 0 0 0 & 0 0 0 0
                        ;       USING AC2       FPS = 47604     FEC = N/A
                        ;*****************************************************************
011756  104400                    SCOPE
011760  170127  047600            LDFPS   #47604&57760
011764  172667  000030            LDD     N52,2           ;LOAD 140200 INTO AC2
011770  171667  000034            MODD    M52,2           ;MODIFY 140200 BY 40200
011774  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
011776  022700  047604            CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
012002  001401                    BEQ     .+4             ;BRANCH IF OK
012004  104000                    HLT                     ;FPS NOT EQUAL TO 47604

012006  174267  166770            STD     2,ANS1          ;STORE FRACTIONAL PART
012012  174367  166774            STD     2!1,ANS5        ;STORE INTERGER PART
012016  000410                    BR      052

012020  140200  000000  000000  N52:   140200,0,0,0
012026  000000
012030  040200  000000  000000  M52:   40200,0,0,0
012036  000000
012040  022767  000000  166734  052:   CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
012046  001401                    BEQ     .+4
012050  104010                    HLT+8.                  ;FIRST # 0

012052  022767  000000  166724        CMP     #0,ANS2         ;CHECK SECOND WORD
012060  001401                    BEQ     .+4
012062  104010                    HLT+8.                  ;SECOND # 0

012064  022767  000000  166714        CMP     #0,ANS3         :CHECK THIRD WORD
012072  001401                    BEQ     .+4
012074  104010                    HLT+8.                  ;THIRD # 0

012076  022767  000000  166704        CMP     #0,ANS4         :CHECK FORTH
012104  001401                    BEQ     .+4
012106  104010                    HLT+8.                  ;FORTH # 0

012110  022767  140200  166674        CMP     #140200,ANS5    ;CHECK FIRST WORD OF INTEGER
012116  001401                    BEQ     .+4
012120  104010                    HLT+8.                  ;FIRST # 140200

012122  022767  000000  166664        CMP     #0,ANS6         ;CHECK SECOND WORD
012130  001401                    BEQ     .+4
012132  104010                    HLT+8.                  :SECOND # 0

012134  022767  000000  166654        CMP     #0,ANS7         :CHECK THIRD WORD
012142  001401                    BEQ     .+4
012144  104010                    HLT+8.                  :THIRD # 0

012146  022767  000000  166644        CMP     #0,ANS8         :CHECK FORTH WORD
012154  001401                    BEQ     .+4
012156  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 53                TEST OF MODD FPU INSTRUCTION
                        ;       140214 146314 146314 146315 * 40200 0 0 0 =
                        ;       140200 0 0 0 & 137314 146314 146314 146320
                        ;       USING AC2       FPS = 47610     FEC = N/A
                        ;*****************************************************************
012160  104400                  SCOPE
012162  170127  047600          LDFPS   #47610&57760
012166  172667  000030          LDD     N53,2           ;LOAD 140214 INTO AC2
012172  171667  000034          MODD    M53,2           ;MODIFY 140214 BY 40200
012176  170200                  STFPS   FPS             ;STORE FLOATING POINT STATUS
012200  022700  047610          CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
012204  001401                  BEQ     .+4             ;BRANCH IF OK
012206  104000                  HLT                     ;FPS NOT EQUAL TO 47610

012210  174267  166566          STD     2,ANS1          ;STORE FRACTIONAL PART
012214  174367  166572          STD     2!1,ANS5        ;STORE INTERGER PART
012220  000410                  BR      C53

012222  140214  146314  146314  N53:    140214,146314,146314,146315
012230  146315
012232  040200  000000  000000  M53:    40200,0,0,0
012240  000000
012242  022767  137314  166532  C53:    CMP     #137314,ANS1    ;CHECK FIRST WORD OF FRACTION
012250  001401                  BEQ     .+4
012252  104010                  HLT+8.                  ;FIRST # 137314

012254  022767  146314  166522          CMP     #146314,ANS2    ;CHECK SECOND WORD
012262  001401                  BEQ     .+4
012264  104010                  HLT+8.                  ;SECOND # 146314

012266  022767  146314  166512          CMP     #146314,ANS3    ;CHECK THIRD WORD
012274  001401                  BEQ     .+4
012276  104010                  HLT+8.                  ;THIRD # 146314

012300  022767  146320  166502          CMP     #146320,ANS4    ;CHECK FORTH
012306  001401                  BEQ     .+4
012310  104010                  HLT+8.                  ;FORTH # 146320

012312  022767  140200  166472          CMP     #140200,ANS5    ;CHECK FIRST WORD OF INTEGER
012320  001401                  BEQ     .+4
012322  104010                  HLT+8.                  ;FIRST # 140200

012324  022767  000000  166462          CMP     #0,ANS6         ;CHECK SECOND WORD
012332  001401                  BEQ     .+4
012334  104010                  HLT+8.                  ;SECOND # 0

012336  022767  000000  166452          CMP     #0,ANS7         ;CHECK THIRD WORD
012344  001401                  BEQ     .+4
012346  104010                  HLT+8.                  ;THIRD # 0

012350  022767  000000  166442          CMP     #0,ANS8         ;CHECK FORTH WORD
012356  001401                  BEQ     .+4
012360  104010                  HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 54                TEST OF MODD FPU INSTRUCTION
                        ;       140414 146314 146314 146315 * 40200 0 0 0 =
                        ;       140400 0 0 0 & 137514 146314 146314 146320
                        ;       USING AC2       FPS = 47610     FEC = N/A
                        ;*****************************************************************
012362  104400                    SCOPE
012364  170127  047600            LDFPS   #47610&57760
012370  172667  000030            LDD     N54,2           ;LOAD 140414 INTO AC2
012374  171667  000034            MODD    M54,2           ;MODIFY 140414 BY 40200
012400  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
012402  022700  047610            CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
012406  001401                    BEQ     .+4             ;BRANCH IF OK
012410  104000                    HLT                     ;FPS NOT EQUAL TO 47610

012412  174267  166364            STD     2,ANS1          ;STORE FRACTIONAL PART
012416  174367  166370            STD     2!1,ANS5        ;STORE INTERGER PART
012422  000410                    BR      054

012424  140414  146314  146314  N54:    140414,146314,146314,146315
012432  146315
012434  040200  000000  000000  M54:    40200,0,0,0
012442  000000
012444  022767  137514  166330  054:    CMP     #137514,ANS1    ;CHECK FIRST WORD OF FRACTION
012452  001401                    BEQ     .+4
012454  104010                    HLT+8.                  ;FIRST # 137514

012456  022767  146314  166320            CMP     #146314,ANS2    ;CHECK SECOND WORD
012464  001401                    BEQ     .+4
012466  104010                    HLT+8.                  ;SECOND # 146314

012470  022767  146314  166310            CMP     #146314,ANS3    ;CHECK THIRD WORD
012476  001401                    BEQ     .+4
012500  104010                    HLT+8.                  ;THIRD # 146314

012502  022767  146320  166300            CMP     #146320,ANS4    ;CHECK FORTH
012510  001401                    BEQ     .+4
012512  104010                    HLT+8.                  ;FORTH # 146320

012514  022767  140400  166270            CMP     #140400,ANS5    ;CHECK FIRST WORD OF INTEGER
012522  001401                    BEQ     .+4
012524  104010                    HLT+8.                  ;FIRST # 140400

012526  022767  000000  166260            CMP     #0,ANS6         ;CHECK SECOND WORD
012534  001401                    BEQ     .+4
012536  104010                    HLT+8.                  ;SECOND # 0

012540  022767  000000  166250            CMP     #0,ANS7         ;CHECK THIRD WORD
012546  001401                    BEQ     .+4
012550  104010                    HLT+8.                  ;THIRD # 0

012552  022767  000000  166240            CMP     #0,ANS8         ;CHECK FORTH WORD
012560  001401                    BEQ     .+4
012562  104010                    HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 55                TEST OF MODD FPU INSTRUCTION
                        ;       140523 31463 31463 31463 * 40200 0 0 0 =
                        ;       140500 0 0 0 & 137631 114631 114631 114630
                        ;       USING AC2       FPS = 47610     FEC = N/A
                        ;*****************************************************************
012564  104400                    SCOPE
012566  170127  047600            LDFPS   #47610&57760
012572  172667  000030            LDD     N55,2                   ;LOAD 140523 INTO AC2
012576  171667  000034            MODD    N55,2                   ;MODIFY 140523 BY 40200
012602  170200                    STFPS   FPS                     ;STORE FLOATING POINT STATUS
012604  022700  047610            CMP     #47610,FPS              ;CHECK FLOATING POINT STATUS
012610  001401                    BEQ     .+4                     ;BRANCH IF OK
012612  104000                    HLT                             ;FPS NOT EQUAL TO 47610

012614  174267  166162            STD     2,ANS1                  ;STORE FRACTIONAL PART
012620  174367  166166            STD     2!1,ANS5                ;STORE INTEGER PART
012624  000410                    BR      OSS

012626  140523  031463  031463  N55:    140523,31463,31463,31463
012634  031463
012636  040200  000000  000000  M55:    40200,0,0,0
012644  000000
012646  022767  137631  166126  OSS:    CMP     #137631,ANS1    ;CHECK FIRST WORD OF FRACTION
012654  001401                    BEQ     .+4
012656  104010                    HLT+8.                  ;FIRST # 137631

012660  022767  114631  166116            CMP     #114631,ANS2    ;CHECK SECOND WORD
012666  001401                    BEQ     .+4
012670  104010                    HLT+8.                  ;SECOND # 114631

012672  022767  114631  166106            CMP     #114631,ANS3    ;CHECK THIRD WORD
012700  001401                    BEQ     .+4
012702  104010                    HLT+8.                  ;THIRD # 114631

012704  022767  114630  166076            CMP     #114630,ANS4    ;CHECK FORTH
012712  001401                    BEQ     .+4
012714  104010                    HLT+8.                  ;FORTH # 114630

012716  022767  140500  166066            CMP     #140500,ANS5    ;CHECK FIRST WORD OF INTEGER
012724  001401                    BEQ     .+4
012726  104010                    HLT+8.                  ;FIRST # 140500

012730  022767  000000  166056            CMP     #0,ANS6         ;CHECK SECOND WORD
012736  001401                    BEQ     .+4
012740  104010                    HLT+8.                  ;SECOND # 0

012742  022767  000000  166046            CMP     #0,ANS7         ;CHECK THIRD WORD
012750  001401                    BEQ     .+4
012752  104010                    HLT+8.                  ;THIRD # 0

012754  022767  000000  166036            CMP     #0,ANS8         ;CHECK FORTH WORD
012762  001401                    BEQ     .+4
012764  104010                    HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 56                TEST OF MODD FPU INSTRUCTION
                                ;       140660 0 0 0 * 40200 0 0 0 =
                                ;       140640 0 0 0 & 140000 0 0 0
                                ;       USING AC2       FPS = 47610     FEC = N/A
                                ;*****************************************************************
013756  104400                          SCOPE
013760  170127  047600                  LDFPS   #47610857760
013764  172667  000030                  LDD     N56,2           ;LOAD 140660 INTO AC2
013770  171667  000034                  MODD    M56,2           ;MODIFY 140660 BY 40200
013774  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
013776  022700  047610                  CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
014002  001401                          BEQ     .+4             ;BRANCH IF OK
014004  104000                          HLT                     ;FPS NOT EQUAL TO 47610

014006  174267  165760                  STD     2,ANS1          ;STORE FRACTIONAL PART
014012  174367  165764                  STD     2!1,ANS5        ;STORE INTERGER PART
014016  000410                          BR      056

014020  140660  000000  000000  N56:    140660,0,0,0
014026  000000
014030  040200  000000  000000  M56:    40200,0,0,0
014036  000000
014040  022767  140000  165724  056:    CMP     #140000,ANS1    ;CHECK FIRST WORD OF FRACTION
014046  001401                          BEQ     .+4
014050  104010                          HLT+8.                  ;FIRST # 140000

014052  022767  000000  165714          CMP     #0,ANS2         ;CHECK SECOND WORD
014060  001401                          BEQ     .+4
014062  104010                          HLT+8.                  ;SECOND # 0

014064  022767  000000  165704          CMP     #0,ANS3         ;CHECK THIRD WORD
014072  001401                          BEQ     .+4
014074  104010                          HLT+8.                  ;THIRD # 0

014076  022767  000000  165674          CMP     #0,ANS4         ;CHECK FORTH
014104  001401                          BEQ     .+4
014106  104010                          HLT+8.                  ;FORTH # 0

014110  022767  140640  165664          CMP     #140640,ANS5    ;CHECK FIRST WORD OF INTEGER
014116  001401                          BEQ     .+4
014120  104010                          HLT+8.                  ;FIRST # 140640

014122  022767  000000  165654          CMP     #0,ANS6         ;CHECK SECOND WORD
014130  001401                          BEQ     .+4
014132  104010                          HLT+8.                  ;SECOND # 0

014134  022767  000000  165644          CMP     #0,ANS7         ;CHECK THIRD WORD
014142  001401                          BEQ     .+4
014144  104010                          HLT+8.                  ;THIRD # 0

014146  022767  000000  165634          CMP     #0,ANS8         ;CHECK FORTH WORD
014154  001401                          BEQ     .+4
014156  104010                          HLT+8.                  ;FORTH # 0
```

```
                        ;*****************************************************************
                        ;TEST 57                TEST OF MODD FPU INSTRUCTION
                        ;       52525 52525 52525 52525 * 40200 0 0 0 =
                        ;       52525 52525 52525 40000 & 37652 124000 0 0
                        ;       USING AC2       FPS = 47600     FEC = N/A
                        ;*****************************************************************
013170  104400                  SCOPE
013172  170127  047600          LDFPS   #47600&57760
013176  172667  000030          LDD     N57,2           ;LOAD 52525 INTO AC2
013202  171667  000034          MODD    M57,2           ;MODIFY 52525 BY 40200
013206  170200                  S FPS   FPS             ;STORE FLOATING POINT STATUS
013210  022700  047600          CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
013214  001401                  BEQ     .+4             ;BRANCH IF OK
013216  104000                  HLT                     ;FPS NOT EQUAL TO 47600

013220  174267  165556          STD     2,ANS1          ;STORE FRACTIONAL PART
013224  174367  165562          STD     2!!,ANS5        ;STORE INTEGER PART
013230  000410                  BR      057

013232  052525  052525  052525  N57:    52525,52525,52525,52525
013240  052525
013242  040200  000000  000000  M57:    40200,0,0,0
013250  000000
013252  022767  037652  165522  057:    CMP     #37652,ANS1     ;CHECK FIRST WORD OF FRACTION
013260  001401                  BEQ     .+4
013262  104010                  HLT+8.                  ;FIRST # 37652
013264  022767  124000  165512          CMP     #124000,ANS2    ;CHECK SECOND WORD
013272  001401                  BEQ     .+4
013274  104010                  HLT+8.                  ;SECOND # 124000

013276  022767  000000  165502          CMP     #0,ANS3         ;CHECK THIRD WORD
013304  001401                  BEQ     .+4
013306  104010                  HLT+8.                  ;THIRD # 0

013310  022767  000000  165472          CMP     #0,ANS4         ;CHECK FORTH
013316  001401                  BEQ     .+4
013320  104010                  HLT+8.                  ;FORTH # 0

013322  022767  052525  165462          CMP     #52525,ANS5     ;CHECK FIRST WORD OF INTEGER
013330  001401                  BEQ     .+4
013332  104010                  HLT+8.                  ;FIRST # 52525

013334  022767  052525  165452          CMP     #52525,ANS6     ;CHECK SECOND WORD
013342  001401                  BEQ     .+4
013344  104010                  HLT+8.                  ;SECOND # 52525

013346  022767  052525  165442          CMP     #52525,ANS7     ;CHECK THIRD WORD
013354  001401                  BEQ     .+4
013356  104010                  HLT+8.                  ;THIRD # 52525

013360  022767  040000  165432          CMP     #40000,ANS8     ;CHECK FORTH WORD
013366  001401                  BEQ     .+4
013370  104010                  HLT+8.                  ;FORTH # 40000
```

```
                        ;*****************************************************************
                        ;TEST 60                TEST OF MODD FPU INSTRUCTION
                        ;       125252 125252 125252 125252 * 40200 0 0 0 =
                        ;       0 0 0 0 & 125252 125252 125252 125252
                        ;       USING AC2       FPS = 47610     FEC = N/A
                        ;*****************************************************************
013372  104400                    SCOPE
013374  170127  047600            LDFPS   #47610&57760
013400  172667  000030            LDD     N60,2           ;LOAD 125252 INTO AC2
013404  171667  000034            MODD    M60,2           ;MODIFY 125252 BY 40200
013410  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
013412  022700  047610            CMP     #47610,FPS      ;CHECK FLOATING POINT STATUS
013416  001401                    BEQ     .+4             ;BRANCH IF OK
013420  104000                    HLT                     ;FPS NOT EQUAL TO 47610

013422  174267  165354            STD     2,ANS1          ;STORE FRACTIONAL PART
013426  174367  165360            STD     2!1,ANS5        ;STORE INTERGER PART
013432  000410                    BR      060

013434  125252  125252  125252  N60:    125252,125252,125252,125252
013442  125252
013444  040200  000000  000000  M60:    40200,0,0,0
013452  000000
013454  022767  125252  165320  060:    CMP     #125252,ANS1    ;CHECK FIRST WORD OF FRACTION
013462  001401                    BEQ     .+4
013464  104010                    HLT+8.                  ;FIRST # 125252

013466  022767  125252  165310            CMP     #125252,ANS2    ;CHECK SECOND WORD
013474  001401                    BEQ     .+4
013476  104010                    HLT+8.                  ;SECOND # 125252

013500  022767  125252  165300            CMP     #125252,ANS3    ;CHECK THIRD WORD
013506  001401                    BEQ     .+4
013510  104010                    HLT+8.                  ;THIRD # 125252

013512  022767  125252  165270            CMP     #125252,ANS4    ;CHECK FORTH
013520  001401                    BEQ     .+4
013522  104010                    HLT+8.                  ;FORTH # 125252

013524  022767  000000  165260            CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
013532  001401                    BEQ     .+4
013534  104010                    HLT+8.                  ;FIRST # 0

013536  022767  000000  165250            CMP     #0,ANS6         ;CHECK SECOND WORD
013544  001401                    BEQ     .+4
013546  104010                    HLT+8.                  ;SECOND # 0

013550  022767  000000  165240            CMP     #0,ANS7         ;CHECK THIRD WORD
013556  001401                    BEQ     .+4
013560  104010                    HLT+8.                  ;THIRD # 0

013562  022767  000000  165230            CMP     #0,ANS8         ;CHECK FORTH WORD
013570  001401                    BEQ     .+4
013572  104010                    HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 61                TEST OF MODD FPU INSTRUCTION
                                ;       52525 52525 52525 52525 * 44000 0 0 0 =
                                ;       56325 52525 52525 52525 & 0 0 0 0
                                ;       USING AC0       FPS = 47604     FEC = N/A
                                ;*****************************************************************
013574  104400                          SCOPE
013576  170127  047600                  LDFPS   #47604&57760
013602  172467  000030                  LDD     N61,0           ;LOAD 52525 INTO AC0
013606  171467  000034                  MODD    M61,0           ;MODIFY 52525 BY 44000
013612  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
013614  022700  047604                  CMP     #47604,FPS      ;CHECK FLOATING POINT STATUS
013620  001401                          BEQ     .+4             ;BRANCH IF OK
013622  104000                          HLT                     ;FPS NOT EQUAL TO 47604

013624  174067  165152                  STD     0,ANS1          ;STORE FRACTIONAL PART
013630  174167  165156                  STD     0!1,ANS5        ;STORE INTERGER PART
013634  000410                          BR      061

013636  052525  052525  052525  N61:    52525,52525,52525,52525
013644  052525
013646  044000  000000  000000  M61:    44000,0,0,0
013654  000000
013656  022767  000000  165116  061:    CMP     #0,ANS1         ;CHECK FIRST WORD OF FRACTION
013664  001401                          BEQ     .+4
013666  104010                          HLT+8.                  ;FIRST # 0

013670  022767  000000  165106          CMP     #0,ANS2         ;CHECK SECOND WORD
013676  001401                          BEQ     .+4
013700  104010                          HLT+8.                  ;SECOND # 0

013702  022767  000000  165076          CMP     #0,ANS3         ;CHECK THIRD WORD
013710  001401                          BEQ     .+4
013712  104010                          HLT+8.                  ;THIRD # 0

013714  022767  000000  165066          CMP     #0,ANS4         ;CHECK FORTH
013722  001401                          BEQ     .+4
013724  104010                          HLT+8.                  ;FORTH # 0

013726  022767  056325  165056          CMP     #56325,ANS5     ;CHECK FIRST WORD OF INTEGER
013734  001401                          BEQ     .+4
013736  104010                          HLT+8.                  ;FIRST # 56325

013740  022767  052525  165046          CMP     #52525,ANS6     ;CHECK SECOND WORD
013746  001401                          BEQ     .+4
013750  104010                          HLT+8.                  ;SECOND # 52525

013752  022767  052525  165036          CMP     #52525,ANS7     ;CHECK THIRD WORD
013760  001401                          BEQ     .+4
013762  104010                          HLT+8.                  ;THIRD # 52525

013764  022767  052525  165026          CMP     #52525,ANS8     ;CHECK FORTH WORD
013772  001401                          BEQ     .+4
013774  104010                          HLT+8.                  ;FORTH # 52525
```

```
                        ;*****************************************************************
                        ;TEST 62                TEST OF MODD FPU INSTRUCTION
                        ;       37600 0 0 0 * 40200 0 0 0 =
                        ;       0 0 0 0 & 37600 0 0 0
                        ;       USING AC2       FPS = 47600     FEC = N/A
                        ;*****************************************************************
013776  104400                    SCOPE
014000  170127  047600            LDFPS   #47600&57760
014004  172667  000030            LDD     N62,2           ;LOAD 37600 INTO AC2
014010  171667  000034            MODD    M62,2           ;MODIFY 37600 BY 40200
014014  170200                    STFPS   FPS             ;STORE FLOATING POINT STATUS
014016  022700  047600            CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
014022  001401                    BEQ     .+4             ;BRANCH IF OK
014024  104000                    HLT                     ;FPS NOT EQUAL TO 47600

014026  174267  164750            STD     2,ANS1          ;STORE FRACTIONAL PART
014032  174367  164754            STD     2!1,ANS5        ;STORE INTERGER PART
014036  000410                    BR      062

014040  037600  000000  000000  N62:    37600,0,0,0
014046  000000
014050  040200  000000  000000  M62:    40200,0,0,0
014056  000000
014060  022767  037600  164714  062:    CMP     #37600,ANS1     ;CHECK FIRST WORD OF FRACTION
014066  001401                    BEQ     .+4
014070  104010                    HLT+8.                  ;FIRST # 37600

014072  022767  000000  164704          CMP     #0,ANS2         ;CHECK SECOND WORD
014100  001401                    BEQ     .+4
014102  104010                    HLT+8.                  ;SECOND # 0

014104  022767  000000  164674          CMP     #0,ANS3         ;CHECK THIRD WORD
014112  001401                    BEQ     .+4
014114  104010                    HLT+8.                  ;THIRD # 0

014116  022767  000000  164664          CMP     #0,ANS4         ;CHECK FORTH
014124  001401                    BEQ     .+4
014126  104010                    HLT+8.                  ;FORTH # 0

014130  022767  000000  164654          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
014136  001401                    BEQ     .+4
014140  104010                    HLT+8.                  ;FIRST # 0

014142  022767  000000  164644          CMP     #0,ANS6         ;CHECK SECOND WORD
014150  001401                    BEQ     .+4
014152  104010                    HLT+8.                  ;SECOND # 0

014154  022767  000000  164634          CMP     #0,ANS7         ;CHECK THIRD WORD
014162  001401                    BEQ     .+4
014164  104010                    HLT+8.                  ;THIRD # 0

014166  022767  000000  164624          CMP     #0,ANS8         ;CHECK FORTH WORD
014174  001401                    BEQ     .+4
014176  104010                    HLT+8.                  ;FORTH # 0
```

```
                                ;*****************************************************************
                                ;TEST 63                TEST OF MODD FPU INSTRUCTION
                                ;       40200 0 0 0 * 10000 0 0 0 =
                                ;       0 0 0 0 & 10000 0 0 0
                                ;       USING AC2       FPS = 47600     FEC = N/A
                                ;*****************************************************************
014230  104400                          SCOPE
014232  177127  047600                  LDFPS   #47600&57760
014236  172667  000030                  LDD     N63,2           ;LOAD 40200 INTO AC2
014242  171667  000034                  MODD    M63,2           ;MODIFY 40200 BY 10000
014246  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
014250  022700  047600                  CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
014254  001401                          BEQ     .+4             ;BRANCH IF OK
014256  104000                          HLT                     ;FPS NOT EQUAL TO 47600

014260  174267  164546                  STD     2,ANS1          ;STORE FRACTIONAL PART
014264  174367  164552                  STD     2!1,ANS5        ;STORE INTERGER PART
014270  000410                          BR      063

014272  040200  000000  000000  N63:    40200,0,0,0
014300  000000
014302  010000  000000  000000  M63:    10000,0,0,0
014310  000000
014312  022767  010000  164512  063:    CMP     #10000,ANS1     ;CHECK FIRST WORD OF FRACTION
014320  001401                          BEQ     .+4
014322  104010                          HLT+8.                  ;FIRST # 10000

014324  022767  000000  164502          CMP     #0,ANS2         ;CHECK SECOND WORD
014332  001401                          BEQ     .+4
014334  104010                          HLT+8.                  ;SECOND # 0

014336  022767  000000  164472          CMP     #0,ANS3         ;CHECK THIRD WORD
014344  001401                          BEQ     .+4
014346  104010                          HLT+8.                  ;THIRD # 0

014350  022767  000000  164462          CMP     #0,ANS4         ;CHECK FORTH
014356  001401                          BEQ     .+4
014360  104010                          HLT+8.                  ;FORTH # 0

014362  022767  000000  164452          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
014370  001401                          BEQ     .+4
014372  104010                          HLT+8.                  ;FIRST # 0

014374  022767  000000  164442          CMP     #0,ANS6         ;CHECK SECOND WORD
014402  001401                          BEQ     .+4
014404  104010                          HLT+8.                  ;SECOND # 0

014406  022767  000000  164432          CMP     #0,ANS7         ;CHECK THIRD WORD
014414  001401                          BEQ     .+4
014416  104010                          HLT+8.                  ;THIRD # 0

014420  022767  000000  164422          CMP     #0,ANS8         ;CHECK FORTH WORD
014426  001401                          BEQ     .+4
014430  104010                          HLT+8.                  ;FORTH # 0
```

```
                                        ;*****************************************************************
                                        ;TEST 64                TEST OF MODD FPU INSTRUCTION
                                        ;       40600 0 0 0 * 37400 0 0 0 =
                                        ;       0 0 0 0 & 40000 0 0 0
                                        ;       USING AC0       FPS = 47600     FEC = N/A
                                        ;*****************************************************************
014402  104400                          SCOPE
014404  170127  047600                  LDFPS   #47600&57760
014410  172467  000030                  LDD     N64,0           ;LOAD 40600 INTO AC0
014414  171467  000034                  MODD    M64,0           ;MODIFY 40600 BY 37400
014420  170200                          STFPS   FPS             ;STORE FLOATING POINT STATUS
014422  022700  047600                  CMP     #47600,FPS      ;CHECK FLOATING POINT STATUS
014426  001401                          BEQ     .+4             ;BRANCH IF OK
014430  104000                          HLT                     ;FPS NOT EQUAL TO 47600

014432  174067  164344                  STD     0,ANS1          ;STORE FRACTIONAL PART
014436  174167  164350                  STD     0!1,ANS5        ;STORE INTERGER PART
014442  000410                          BR      064

014444  040600  000000  000000  N64:    40600.0,0,0,0
014452  000000
014454  037400  000000  000000  M64:    37400.0,0,0,0
014462  000000
014464  022767  040000  164310  064:    CMP     #40000,ANS1     ;CHECK FIRST WORD OF FRACTION
014472  001401                          BEQ     .+4
014474  104010                          HLT+8.                  ;FIRST # 40000

014476  022767  000000  164300          CMP     #0,ANS2         ;CHECK SECOND WORD
014504  001401                          BEQ     .+4
014506  104010                          HLT+8.                  ;SECOND # 0

014510  022767  000000  164270          CMP     #0,ANS3         ;CHECK THIRD WORD
014516  001401                          BEQ     .+4
014520  104010                          HLT+8.                  ;THIRD # 0

014522  022767  000000  164260          CMP     #0,ANS4         ;CHECK FORTH
014530  001401                          BEQ     .+4
014532  104010                          HLT+8.                  ;FORTH # 0

014534  022767  000000  164250          CMP     #0,ANS5         ;CHECK FIRST WORD OF INTEGER
014542  001401                          BEQ     .+4
014544  104010                          HLT+8.                  ;FIRST # 0

014546  022767  000000  164240          CMP     #0,ANS6         ;CHECK SECOND WORD
014554  001401                          BEQ     .+4
014556  104010                          HLT+8.                  ;SECOND # 0

014560  022767  000000  164230          CMP     #0,ANS7         ;CHECK THIRD WORD
014566  001401                          BEQ     .+4
014570  104010                          HLT+8.                  ;THIRD # 0

014572  022767  000000  164220          CMP     #0,ANS8         ;CHECK FORTH WORD
014600  001401                          BEQ     .+4
014602  104010                          HLT+8.                  ;FORTH # 0
```

```
014604  104400                  DONE:   SCOPE
014606  032737  002000  177570          BIT     #SW10,@#SWR     ;RING THE BELL?
014614  001005                          BNE     1$              ;NO!
014616  012767  000007  001242          MOV     #BELL,.TYPE     ;TYPE A BELL
014624  000004  016066                  TYPE    ,.TYPE
014630  005046                  1$:     CLR     -(6)            ;CLEAR TRACE TRAP
014632  032737  010000  177570          BIT     #SW12,@#SWR     ;RUN WITH TRT?
014640  001010                          BNE     2$
014642  005167  001222                  COM     TRPB
014646  100005                          BPL     2$
014650  052716  000020                  BIS     #20,(6)         ;SET TRACE TRAP
014654  012746  001062                  MOV     #BEGIN,-(6)     ;JUMP TO START OF TEST
014660  000412                          BR      YESRT
014662  012746  001062          2$:     MOV     #BEGIN,-(6)     ;JUMP TO START OF TEST
014666  013700  000042                  MOV     @#42,R0         ;GET MONITOR ADDRESS
014672  001404                          BEQ     3$              ;IF NONE
014674  004710                          JSR     7,(0)           ;GO TO MONITOR
014676  000240                          NOP
014700  000240                          NOP
014702  000240                          NOP
014704  000002                  3$:     RTI
014706  000002                  YESRT:  RTI                     ;RETURN TO PROGRAM FROM TRAP

014710  032737  000400  177570  .EMT:   BIT     #SW08,@#SWR     ;KILL LOOP OR LOOP ON SPEC. TEST
014716  001404                          BEQ     1$
014720  123767  177570  164052          CMPB    @#SWR,ICNT      ;ON RIGHT TEST?   #SW7-0#
014726  001437                          BEQ     OVER
014730  113703  177570          1$:     MOVB    @#SWR,R3        ;GET UB BITS
014734  170003                          LDUB
014736  032737  040000  177570          BIT     #SW14,@#SWR     ;LOOP ON TEST
014744  001026                          BNE     KIT
014746  032737  004000  177570          BIT     #SW11,@#SWR     ;KILL ITERATIONS
014754  001012                          BNE     SAVLAD
014756  105767  164017                  TSTB    ICNT+1
014762  001404                          BEQ     2$              ;BRANCH IF FIRST
014764  126767  001106  164007          CMPB    TIMES,ICNT+1    ;DONE?
014772  001013                          BNE     KIT             ;BRANCH IF NOT
014774  112767  000001  163777  2$:     MOVB    #1,ICNT+1       ;FIRST ITERATION
015002  105267  163772          SAVLAD: INCB    ICNT            ;COUNT TEST NUMBERS
015006  011667  001060                  MOV     (6),LAD         ;SAVE LOOP ADDRESS
015012  016737  163762  177570          MOV     ICNT,@#DISPLAY  ;DISPLAY TEST NO. AND ITERATION COUNT
015020  000002                          RTI                     ;RETURN

015022  105267  163753          KIT:    INCB    ICNT+1
015026  016737  163746  177570  OVER:   MOV     ICNT,@#DISPLAY  ;SET UP DISPLAY
015034  005767  001032                  TST     LAD             ;FIRST ONE?
015040  001760                          BEQ     SAVLAD
015042  016716  001024                  MOV     LAD,(6)         ;FUDGE RETURN ADDRESS
015046  000002                          RTI                     ;FIXES PS
```

```
015050  032737  002000  177570  .TRP:   BIT     #SW10,@#SWR     ;BELL ON ERROR?
015056  001405                          BEQ     1$              ;NO - SKIP
015060  012767  000007  001000          MOV     #BELL,.TYPE     ;TYPE A BELL
015066  000004  016066                  TYPE    .TYPE
015072  004767  000406          1$:     JSR     PC,ERROR        ;COUNT THE NUMBER OF ERRORS
015076  010446                          MOV     R4,-(6)
015100  032737  020000  177570          BIT     #SW13,@#SWR     ;SKIP TYPEOUT IF SET
015106  001072                          BNE     4$
015110  000004  016034                  TYPE    ,RETURN
015114  016646  000002                  MOV     2(6),-(6)       ;PUT ADDRESS OF INSTRUCTION ON STACK
015120  162716  000002                  SUB     #2,(6)
015124  011605                          MOV     (6),TTY         ;TYPE (6) IN OCTAL
015126  004767  000212                  JSR     %7,PRINTR       ;TYPE LEADING ZERO'S
015132  000004  016042                  TYPE    ,SPACE+3
015136  010005                          MOV     R0,TTY          ;TYPE R0 IN OCTAL
015140  004767  000200                  JSR     %7,PRINTR       ;TYPE LEADING ZERO'S
015144  000004  016043                  TYPE    ,SPACE+4
015150  012703  001002                  MOV     #ANS1,R3        ;ADDRESS OF DATA
015154  113604                          MOVB    @(6)+,R4        ;AMOUNT OF DATA IN TABLE
015156  001426                          BEQ     3$
015160  100016                          BPL     2$              ;TYPE STACK?
015162  016667  000006  163612          MOV     6(6),ANS1
015170  016667  000010  163606          MOV     10(6),ANS2
015176  016667  000012  163602          MOV     12(6),ANS3
015204  016667  000014  163576          MOV     14(6),ANS4
015212  042704  177600                  BIC     #177600,R4      ;CLEAR SIGN
015216  000004  016043          2$:     TYPE    ,SPACE+4
015222  012305                          MOV     (3)+,TTY        ;TYPE (3)+ IN OCTAL
015224  004767  000114                  JSR     %7,PRINTR       ;TYPE LEADING ZERO'S
015230  005304                          DEC     R4
015232  001371                          BNE     2$
015234  005700                  3$:     TST     FPS
015236  100016                          BPL     4$
015240  000004  016037                  TYPE    ,SPACE
015244  170367  163552                  STST    FEC
015250  016705  163546                  MOV     FEC,TTY         ;TYPE FEC IN OCTAL
015254  004767  000064                  JSR     %7,PRINTR       ;TYPE LEADING ZERO'S
015260  000004  016042                  TYPE    ,SPACE+3
015264  016705  163534                  MOV     FEA,TTY         ;TYPE FEA IN OCTAL
015270  004767  000050                  JSR     %7,PRINTR       ;TYPE LEADING ZERO'S
015274  012604                  4$:     MOV     (6)+,R4
015276  005737  177570                  TST     @#SWR           ;HALT ON ERROR
015302  100001                          BPL     .+4             ;SKIP IF CONTINUE
015304  000000                          HALT                    ;HALT ON ERROR!
015306  032737  001000  177570          BIT     #SW09,@#SWR     ;CHECK FOR INHIBIT LOOP ON ERROR
015314  001001                          BNE     .+4             ;SKIP IF LOOP ON ERROR
015316  000002                          RTI
015320  105067  163455                  CLRB    ICNT+1
015324  032737  000400  177570          BIT     #SW08,@#SWR     ;CHECK FOR LOAD MICROBREAK
015332  001233                          BNE     KIT             ;BRANCH IF NOT
015334  113703  177570                  MOVB    @#SWR,R3        ;PUT MICROBREAK ADDRESS IN R3
015340  170003                          LDUB                    ;LOAD MICROBREAK
015342  000627                          BR      KIT             ;LOOP ON TEST UNTIL NO ERRORS
```

```
015344  112767  000001  000130  PRINTR: MOVB    #1,A4$          ;SET ZERO FILL SWITCH
015352  000402                  BR      .+6
015354  005067  000122          PRINTS: CLR     A4$             ;SUPRESS LEADING ZERO'S
015360  112767  177772  000115          MOVB    #-6,A4$+1       ;SET COUNT
015366  010446                  MOV     R4,-(6)         ;SAVE R4
015370  012704  015472                  MOV     #3$,R4          ;SET POINTER TO FIRST ASCII CHAR.
015374  105014                  CLRB    (4)             ;CLEAR FIRST BYTE
015376  000405                  BR      2$              ;ROTATE FIRST BIT
015400  105014          1$:     CLRB    (4)             ;CLEAR BYTE OF CHARACTER
015402  006105                  ROL     TTY             ;ROTATE BIT INTO C
015404  106114                  ROLB    (4)             ;PACK IT
015406  006105                  ROL     TTY             ;ROTATE BIT INTO C
015410  106114                  ROLB    (4)             ;PACK IT
015412  006105          2$:     ROL     TTY             ;ROTATE BIT INTO C
015414  106114                  ROLB    (4)             ;PACK IT
015416  105714                  TSTB    (4)
015420  001402                  BEQ     .+6
015422  105267  000054                  INCB    A4$
015426  105767  000050                  TSTB    A4$             ;CHECK FILL SWITCH
015432  001402                  BEQ     .+6
015434  152724  000060                  BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
015440  105267  000037                  INCB    A4$+1
015444  001355                  BNE     1$              ;REPEAT
015446  022704  015472                  CMP     #3$,R4
015452  001002                  BNE     .+6
015454  112724  000060                  MOVB    #'0,(4)+
015460  105014                  CLRB    (4)
015462  000004  015472                  TYPE    ,3$             ;TYPE IT
015466  012604                  MOV     (6)+,R4         ;RESTORE R4
015470  000207                  RTS     PC

015472  000004          3$:     .BLKW   4
015502  000000          A4$:    0

015504  005267  000364  ERROR:  INC     ERRORS          ;COUNT ERRORS
015510  132737  000001  000041          BITB    #1,@#41         ;AUTO MODE?
015516  001412                  BEQ     1$              ;NO!
015520  022767  000010  000346          CMP     #10,ERRORS      ;TOO MANY?
015526  001006                  BNE     1$              ;NOT YET
015530  013700  000042                  MOV     @#42,R0         ;GET ADDRESS
015534  001403                  BEQ     1$              ;FORGET IT IF ZERO
015536  005037  000042                  CLR     @#42            ;ZAP 42
015542  004710                  JSR     PC,(0)          ;CALL THE MONITOR
015544  000207          1$:     RTS     PC              ;RETURN
```

```
015546  012777  015742  000306  POWDWN: MOV     #ILLUP,@UPVEC   ;SET FOR FAST UP
015554  012777  000340  000302          MOV     #340,@UPVEC+2   ;PRIO:7
015562  170246                          STFPS   -(6)            ;GET THE FPS
015564  170011                          SETD
015566  174046                          STD     AC0,-(6)        ;SAVE AC'S
015570  174146                          STD     AC1,-(6)
015572  174246                          STD     AC2,-(6)
015574  174346                          STD     AC3,-(6)
015576  172404                          LDD     AC4,AC0
016000  174046                          STD     AC0,-(6)
016002  172405                          LDD     AC5,AC0
016004  174046                          STD     AC0,-(6)
016006  010046                          MOV     R0,-(6)         ;SAVE REGISTERS
016010  010146                          MOV     R1,-(6)
016012  010246                          MOV     R2,-(6)
016014  010346                          MOV     R3,-(6)
016016  010446                          MOV     R4,-(6)
016020  010546                          MOV     R5,-(6)
016022  010667  000220                  MOV     SP,SAVE6        ;SAVE SP
016026  012777  015636  000226          MOV     #POWUP,@UPVEC   ;SET UP VECTOR
016034  000000                          HALT

015636  016706  000204          POWUP:  MOV     SAVE6,SP        ;GET SP
015642  005001                          CLR     R1              ;WAIT LOOP FOR THE [illegible]
015644  005201                  1$:     INC     R1
015646  001376                          BNE     1$
015650  012605                          MOV     (6)+,R5         ;GET THE REGISTERS
015652  012604                          MOV     (6)+,R4
015654  012603                          MOV     (6)+,R3
015656  012602                          MOV     (6)+,R2
015660  012601                          MOV     (6)+,R1
015662  012600                          MOV     (6)+,R0
015664  170011                          SETD
015666  172426                          LDD     (6)+,AC0        ;RESTORE THE AC'S
015670  174005                          STD     AC0,AC5
015672  172426                          LDD     (6)+,AC0
015674  174004                          STD     AC0,AC4
015676  172726                          LDD     (6)+,AC3
015700  172626                          LDD     (6)+,AC2
015702  172526                          LDD     (6)+,AC1
015704  172426                          LDD     (6)+,AC0
015706  170126                          LDFPS   (6)+            ;RESTORE FPS
015710  012777  015546  000140          MOV     #POWDWN,@DWNVEC ;SET UP THE POWER DOWN VECTOR
015716  012777  000340  000134          MOV     #340,@DWNVEC+2
015724  000004  015730                  TYPE    ..+2            ;.ASCIZ <15><12>"POWER"
015740  000002                          RTI

015742  000000                  ILLUP:  HALT                    ;THE POWER UP SEQUENCE WAS STARTED
015744  000776                          BR      .-2             ; BEFORE THE POWER DOWN WAS COMPLETE
```

```
016546  010546                  .IOT:   MOV     TTY,-(6)        ;SAVE TTY
016550  017605  000002                  MOV     @2(6),TTY       ;GET ADDRESS TO BE TYPED
016554  105715                  1$:     TSTB    @TTY)           ;TERMINATOR?
016556  001406                          BEQ     2$
016560  112537  177566                  MOVB    @TTY)+,@#177566 ;LOAD AND TYPE THE CHARACTER
016564  105737  177564                  TSTB    @#177564        ;IS THE PRINTER READY
016570  100375                          BPL     .-4
016572  000770                          BR      1$              ;GET THE NEXT CHARACTER
016574  017646  000002          2$:     MOV     @2(6),-(6)      ;GET ADDRESS TO BE TYPED
016600  062766  000002  000004          ADD     #2,4(6)         ;ADD 2 TO THE ADDRESS
016606  022666  000002                  CMP     (6)+,2(6)       ;IS IT .+2?
016612  001006                          BNE     3$              ;NO
016614  062705  000002                  ADD     #2,TTY          ;ADD 2 TO THE ADDRESS
016620  042705  000001                  BIC     #1,TTY          ;BACK UP TO AN EVEN BYTE
016624  010566  000032                  MOV     TTY,2(6)        ;RESTORE ADDRESS
016630  012605                  3$:     MOV     (6)+,TTY        ;RESTORE TTY
016632  000002                          RTI                     ;RETURN

016634  005015      000         RETURN: .ASCIZ  <15><12>        ;RETURN AND LINEFEED
016637      015 020012  020040  SPACE:  .ASCIZ  <15><12>"  "    ;RETURN AND 3 SPACES
016644      000
        016646                  .EVEN
016646  000000                  SAVE6:  0
016650  172160                  FPTADR: 172160                  ;FLOATING POINT ADDRESS ON THE 11/40
016652  000244  000246          FPVECT: 244,246                 ;FLOATING POINT VECTOR ADDRESS
016656  000024  000026          DWNVEC: 24,26                   ;POWER DOWN VECTOR ADDRESS
016662  000024  000026          UPVEC:  24,26                   ;POWER UP VECTOR ADDRESS
016666  000000                  .TYPE:  0
016670  000000                  TPB:
016672  000000                  LAC:                            ;LOOP ADDRESS
016674  000000                  ERRORS:                         ;ERROR COUNT
016676  000377                  TIMES:                          ;ITERATION COUNT
                                .END
```

```
...  =  000000  390#  3129  3133*  3134  3135*  3136  3158*  3159  3160*  3161  3165*
...  =  000000  391#  3130  3164*
...  =  000000  392#  3131  3163*
...  =  000000  393#  3132  3162*
...  =  000000  394#  3133  3161*
...  =  000000  395#  3135  3159*
...  001004  424#  474*  481  512*  519  550*  557  588*  595  626*  633  664*  671
          702*  709  740*  747  778*  785  816*  823  854*  861  892*  899  930*
          937  968*  975  1006*  1013  1044*  1051  1082*  1089  1120*  1127  1158*  1165
          1212*  1220  1266*  1274  1320*  1328  1374*  1382  1428*  1436  1482*  1490  1536*
          1544  1590*  1598  1644*  1652  1698*  1706  1752*  1760  1806*  1814  1860*  1868
          1914*  1922  1968*  1976  2022*  2030  2076*  2084  2130*  2138  2184*  2192  2238*
          2246  2292*  2300  2346*  2354  2400*  2408  2454*  2462  2508*  2516  2562*  2570
          2616*  2624  2670*  2678  2724*  2732  2778*  2786  2832*  2840  2886*  2894  2940*
          2948  3045  3049*
...  001004  425#  485  523  561  599  637  675  713  751  789  827  865  903
          941  979  1017  1055  1093  1131  1170  1224  1278  1332  1386  1440  1494
          1548  1602  1656  1710  1764  1818  1872  1926  1980  2034  2088  2142  2196
          2250  2304  2358  2412  2466  2520  2574  2628  2682  2736  2790  2844  2898
          2952  3050*
...  001006  426#  475*  489  513*  527  551*  565  589*  603  627*  641  665*  679
          703*  717  741*  755  779*  793  817*  831  855*  869  893*  907  933*
          945  969*  983  1007*  1021  1045*  1059  1083*  1097  1121*  1135  1174  1212
          1282  1336  1390  1444  1498  1552  1606  1660  1714  1768  1822  1876  1930
          1984  2038  2092  2146  2200  2254  2308  2362  2416  2470  2524  2578  2632
          2686  2740  2794  2848  2902  2956  3051*
...  001010  427#  493  531  569  607  645  683  721  759  797  835  873  911
          949  987  1025  1063  1101  1139  1178  1232  1286  1340  1394  1448  1502
          1556  1610  1664  1718  1772  1826  1880  1934  1988  2042  2096  2150  2204
          2258  2312  2366  2420  2474  2528  2582  2636  2690  2744  2798  2852  2906
          2960  3052*
...  001012  428#  1159*  1182  1213*  1236  1267*  1290  1321*  1344  1375*  1398  1429*  1452
          1483*  1506  1537*  1560  1591*  1614  1645*  1668  1699*  1722  1753*  1776  1807*
          1830  1861*  1884  1915*  1938  1969*  1992  2023*  2046  2077*  2100  2131*  2154
          2185*  2208  2239*  2262  2293*  2316  2347*  2370  2401*  2424  2455*  2478  2509*
          2532  2563*  2586  2617*  2640  2671*  2694  2725*  2748  2779*  2802  2833*  2856
          2887*  2910  2941*  2964
...  001014  429#  1186  1240  1294  1348  1402  1456  1510  1564  1618  1672  1726  1780
          1834  1888  1942  1996  2050  2104  2158  2212  2266  2320  2374  2428  2482
          2536  2590  2644  2698  2752  2806  2860  2914  2968
...  001016  430#  1190  1244  1298  1352  1406  1460  1514  1568  1622  1676  1730  1784
          1838  1892  1946  2000  2054  2108  2162  2216  2270  2324  2378  2432  2486
          2540  2594  2648  2702  2756  2810  2864  2918  2972
...  001020  431#  1194  1248  1302  1356  1410  1464  1518  1572  1626  1680  1734  1788
          1842  1896  1950  2004  2058  2112  2166  2220  2274  2328  2382  2436  2490
          2544  2598  2652  2706  2760  2814  2868  2922  2976
...  015532  3081*  3083*  3084*  3098*  3099  3102*  3113#
...  001026  434  435#
...  001062  439  444#  2990  2992
...  000007  379#  2982  3030
...  177570  375#  3019*  3023*
...  014604  2979#
...  016056  447*  448*  3167*  3168*  3199#
...  015504  3032  3115#
...  016074  3115*  3118  3204#
...  001024  433#  3066
```

E06


```
FEC        001022        418*   432*   3062*  3063
F.TERR     000760        417*   455
FPS      = 100000        380*   417*   469*   470    507*   508    545*   546    583*   584    621*   622    659*
                         660    697*   698    735*   736    773*   774    811*   812    849*   850    887*   888
                         925*   926    963*   964    1001*  1002   1039*  1040   1077*  1078   1115*  1116   1153*
                         1154   1207*  1208   1261*  1262   1315*  1316   1369*  1370   1423*  1424   1477*  1478
                         1531*  1532   1585*  1586   1639*  1640   1693*  1694   1747*  1748   1801*  1802   1855*
                         1856   1909*  1910   1963*  1964   2017*  2018   2071*  2072   2125*  2126   2179*  2180
                         2233*  2234   2287*  2288   2341*  2342   2395*  2396   2449*  2450   2503*  2504   2557*
                         2558   2611*  2612   2665*  2666   2719*  2720   2773*  2774   2827*  2828   2881*  2882
                         2935*  2936   3059
[illegible] 016050       441    3197*
[illegible] 016052       455*   456*   3198*
[illegible] = 104000     377*   472    483    487    491    495    510    521    525    529    533    548    553
                         563    567    571    586    597    601    605    609    624    635    639    643    647
                         662    673    677    681    685    700    711    715    719    723    738    749    753
                         757    761    776    787    791    795    799    814    825    829    833    837    852
                         863    867    871    875    890    901    905    909    913    928    939    943    947
                         951    966    977    981    985    989    1004   1015   1019   1023   1027   1042   1053
                         1057   1061   1065   1080   1091   1095   1099   1103   1118   1129   1133   1137   [illegible]
                         1156   1168   1172   1176   1180   1184   1188   1192   1196   1210   1222   1226   1230
                         1234   1238   1242   1246   1250   1264   1276   1280   1284   1288   1292   1296   1300
                         1304   1318   1330   1334   1338   1342   1346   1350   1354   1358   1372   1384   1388
                         1392   1396   1400   1404   1408   1412   1426   1438   1442   1446   1450   1454   1458
                         1462   1466   1480   1492   1496   1500   1504   1508   1512   1516   1520   1534   1546
                         1550   1554   1558   1562   1566   1570   1574   1588   1600   1604   1608   1612   1616
                         1620   1624   1628   1642   1654   1658   1662   1666   1670   1674   1678   1692   1696
                         1708   1712   1716   1720   1724   1728   1732   1736   1750   1762   1766   1770   1774
                         1778   1792   1786   1790   1804   1816   1820   1824   1928   1832   1836   1840   1844
                         1858   1870   1874   1878   1882   1886   1890   1894   1898   1912   1924   1928   1932
                         1936   1940   1944   1948   1952   1966   1978   1982   1986   1990   1994   1998   2002
                         2006   2020   2032   2036   2040   2044   2048   2052   2056   2060   2074   2096   2090
                         2094   2098   2102   2106   2110   2114   2128   2140   2144   2148   2152   2156   2160
                         2164   2168   2182   2194   2198   2202   2206   2210   2214   2218   2222   2236   2248
                         2252   2256   2260   2264   2268   2272   2276   2290   2302   2306   2310   2314   2318
                         2322   2326   2330   2344   2356   2360   2364   2368   2372   2376   2380   2384   2398
                         2410   2414   2418   2422   2426   2430   2434   2438   2452   2464   2468   2472   2476
                         2480   2484   2488   2492   2506   2518   2522   2526   2530   2534   2538   2542   2546
                         2560   2572   2576   2580   2584   2588   2592   2596   2600   2614   2626   2630   2634
                         2638   2642   2646   2650   2654   2668   2680   2694   2688   2692   2596   2700   2704
                         2708   2722   2734   2738   2742   2746   2750   2754   2758   2762   2776   2798   2792
                         2796   2800   2804   2808   2812   2816   2830   2842   2846   2850   2954   2959   2962
                         2866   2870   2884   2896   2900   2904   2908   2912   2916   2920   2924   2939   2950
                         2954   2958   2962   2966   2970   2974   2978
ICNT       001000        423*   457*   3004   3012   3014   3016*  3017*  3019   3022*  3023   3075*
[illegible]LOOP 015742   3125   3172*
K[illegible] 015022      3009   3015   3022*  3077   3080
LAD        016072        458*   3018*  3024   3026   3203*
[illegible] = 170004     408*
[illegible] = 170003     404*
[illegible] = 000004     1143*  1197   1251   1305   1359   1413   1467   1521   1575   1629   1683   1737   1791
                         1845   1899   1953*  2007   2061   2115   2169   2223   2277   2331   2385   2439   2493
                         2547   2601   2655   2709   2763*
MRS      = 170006        407*
M[illegible] 001242      468    479*
M[illegible] 0022[illegible]  734    745*
```

```
            002462    772    783#
120         001054    436    441#
            002604    810    821#
            002726    848    859#
            003050    886    897#
            003172    924    935#
            003314    962    973#
            003436   1000   1011#
            001364    506    517#
            003560   1038   1049#
            003702   1076   1087#
            004024   1114   1125#
            004152   1152   1164#
            004354   1206   1218#
            004556   1260   1272#
            004760   1314   1326#
            005162   1368   1380#
            001506    544    555#
            005364   1422   1434#
            005566   1476   1488#
            005770   1530   1542#
            006172   1584   1596#
            006374   1638   1650#
            006576   1692   1704#
            007000   1746   1758#
            007202   1800   1812#
            001630    582    593#
            007404   1854   1866#
            007606   1908   1920#
            010010   1962   1974#
            010212   2016   2028#
            010414   2070   2082#
            010616   2124   2136#
            011020   2178   2190#
            011222   2232   2244#
            001752    620    631#
            011424   2286   2298#
            011626   2340   2352#
            012030   2394   2406#
            012232   2448   2460#
            012434   2502   2514#
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DCFPLB.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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