EAE

BASIC LOGIC TEST

MD-11-DZKEB-B

EP-DZKEB-B-DL

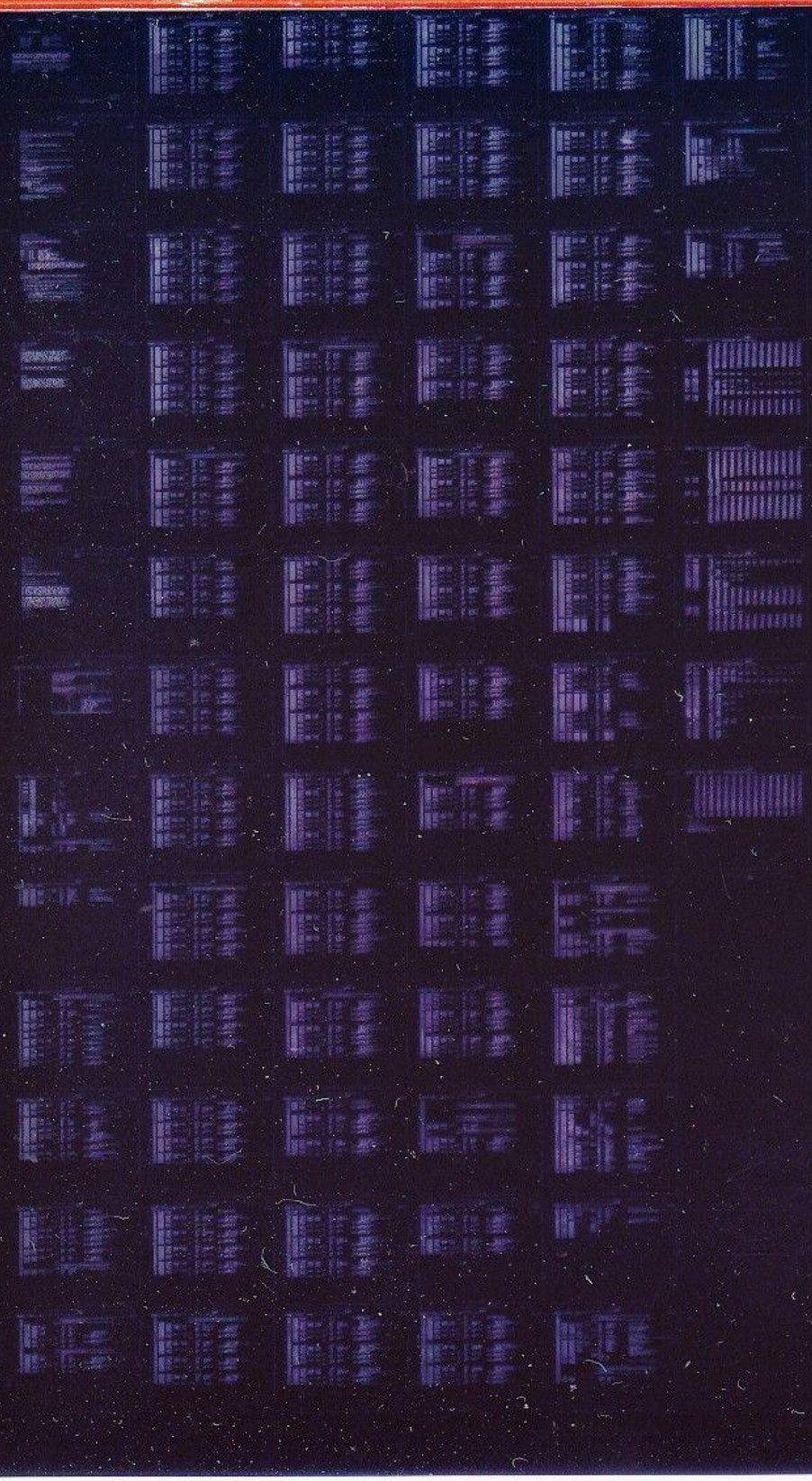
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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZKEB-B-D
PRODUCT NAME: EAE BASIC LOGIC TEST
PRODUCT DATE: FEB 1978
MAINTAINER: DIAGNOSTIC ENGINEERING

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1. ABSTRACT

THIS TEST IS TO BE USED AS AN EAE LOGIC TEST FOR THE PDP-11
WITH THE EAE OPTION. IT TESTS ALL THE FUNCTIONS OF THE EAE
WITH SPECIPIC NUMBER COMBINATIONS.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 STANDARD COMPUTER WITH EAE OPTION
WITH OR WITHOUT THE HARDWARE SWITCH REGISTER

2.2 STORAGE

2.2.1 PROGRAM STORAGE - THE ROUTINE USES 8k MEMORY

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL ABSOLUTE TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

STARTING AT SA 200 ALL SWITCHES SHOULD BE SET AS INDICATED.
***IF SOFTWARE SWITCH REGISTER IS SELECTED THE
FOLLOWING WILL BE PRINTED;
SWR=XXXXXX NEW=
refer to section 5.1.2 for more information***

4.2 STARTING ADDRESS OR ADDRESSES
SA=200

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY.
LOAD STARTING ADDRESS
LOAD ADDRESS.
SET SWITCHES (SEE 5) ALL DOWN FOR WORSE CASE
PRESS START.
NOTE: IF THE SOFTWARE SWITCH REGISTER IS
SELECTED THEN THE FOLLOWING IS PRINTED:
SWR=XXXXXX NEW=
(REFER TO SECTION 5.1 FOR OPERATOR OPTIONS)

THE PROGRAM WILL LOOP AND
BELL WILL RING ONCE PER PASS OF THE PROGRAM.
A MINIMUM OF TWO PASSES SHOULD
ALWAYS BE RUN.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

5.1.1 AT SA 200 .. ALL SWITCHES DOWN WILL TEST ALL OF THE EAE AND PRINT OUT ON ERRORS AND CONTINUE IN TEST. (BELL WILL RING AT COMPLETION OF A PASS)

5.1.2 SWITCH SETTINGS ARE

```
SW15 = 1 OR UP ... HALT ON ERROR
SW14 = 1 OR UP ... SCOPE LOOP
SW13 = 1 OR UP ... INHIBIT PRINTOUT
SW12 = 1 OR UP ... INHIBIT TRACE TRAPPING
SW11 = 1 OR UP ... INHIBIT ITERATION LOOP
SW10 = 1 OR UP ... BELL ON ERROR
       0 OR DOWN . BELL ON PASS COMPLETE
SW01 = 1 OR UP ... INHIBIT MULTIPLY/DIVIDE TEST
SW00 = 1 OR UP ... INHIBIT SHIFT/NORMALIZE TEST
```

IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER. IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH REGISTER (LOC. 176) IS USED.

CONTROL:

THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY DOING THE FOLLOWING:

1) TYPE CONTROL G <↑G>; THIS WILL ALLOW THE TTY TO ENTER DATA INTO LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM.

2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS OF THE SOFTWARE SWITCH REGISTER.)

3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE OF THE FOLLOWING AT THE TTY:

   A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>. (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS WILL BE ALLOWED)
   IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH REGISTER CONTENTS WILL NOT BE CHANGED.

   B) IF A CONTROL U <↑U> IS DEPRESSED THEN THE PROGRAM WILL SEND YOU BACK TO STEP 2.

5.2. SUBROUTINE ABSTRACTS

5.2.1 BEGIN SA 200

5.2.2 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST
IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING
ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED.
IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE
START OF THE SUBTEST THAT THE SCOPE LOOP IS RE-
QUESTED FOR. IF SCOPE LOOP IS NOT REQUESTED, THERE WILL
BE 4000 ITERATIONS ON THAT SUBTEST BEFORE THE NEXT SUBTEST
IS ENTERED. SWITCH 11 ON A 1 INHIBITS ITERATION
OF SUBTESTS. NOTE: SUPPORTS CONT-G ROUTINE

5.2.3 HLT

IS A ROUTINE THAT PRINTS-OUT AN ADDRESS THAT TAGS
THE FAILING SUBTEST,THE AC, MQ, AND SC AT
THE TIME OF THE FAILURE. SUPPORTS CONT-G ROUTINE.

5.2.4 TRTRAP

THIS ROUTINE WILL ALLOW THE TRACE BIT TRAP TO
BE SET AFTER FIRST LOOP OF THE PROGRAM. UNDER NORMAL
TESTING THE TRACE BIT WILL BE SET ON ALTERNATE
LOOPS OF THE PROGRAM. WHEN SET IT CAUSES A TRAP
AFTER EACH INSTRUCTION. THE FIRST INSTRUCTION
EXECUTED UPON TRAPPING IS AN "RTI" WHICH RETURNS TO THE
INTERRUPTED SEQUENCE OF INSTRUCTION. THIS SEQUENCE
IS CONTINUED TILL THE END OF THE PROGRAM LOOP
IS REACHED.

5.2.5 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS STARTING AT LOCATION 0, DESIGNED TO DETECT, AND ISOLATE UNEXPECTED TRAPS AND INTERRUPTS TO THE TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

THE PRINCIPAL OF THIS ROUTINE IS: THE VECTOR ENTRANCE ADDRESS POINTS TO THE NEXT SEQUENTIAL WORD WHICH CONTAINS A HALT (00000). (THIS LOCATION IS ALSO THE STATUS FOR THAT VECTOR ENTRANCE, BUT THIS HAS NO EFFECT ON IT ALSO BEING THE NEXT INSTRUCTION).

IF A HALT OCCURS IN THE TRAP OR INTERRUPT VECTOR AREA, REGISTER SIX SHOULD BE EXAMINED TO DETERMINE ITS CONTENTS, THEN USE REGISTER SIX CONTENTS AS AN ADDRESS TO DETERMINE THE LOCATION THE PROGRAM WAS AT, WHEN THE INTERRUPT OR TRAP OCCURRED. (MEMORY AS SPECIFIED BY R6 CONTAINS THE PC OF THE INSTRUCTION FOLLOWING THE INSTRUCTION WHERE THE TRAP OCCURRED).

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 200 WITH ALL SWITCHES DOWN IS WORSE CASE TESTING. IF AN ERROR IS DETECTED HERE, THERE WILL BE A PRINTOUT. WHEN AN ERROR IS DETECTED AND IT IS NECESSARY TO SCOPE ON IT, PLACE SW15 UP TO HALT ON ERROR, HIT CONTINUE WITH SW14 UP TO LOOP ON ERROR, AND SW13 UP TO DELETE PRINTOUTS.

6. ERRORS

6.1 ERROR PRINTOUT

ARE IN A FOUR WORD FORMAT, THE 1ST IS PC+2 OF THE DETECTED ERROR, THE SECOND IS THE AC, THE THIRD IS THE MQ, AND THE LAST IS THE SC. THE LISTING WILL REFLECT THE TRUE ANSWER.

6.2 ERROR RECOVERY

RESTART AT 200

7. RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

NONE

8. MISCELLANEOUS

THIS PROGRAM SHOULD BE RUN IN CONJUNCTION
WITH MAINDEC-11-DZKEC-A (EAE RANDOM EXERCIZER).

8.1 EXECUTION TIME

ABOUT 40 SECONDS WITH ALL SWITCHES DOWN

9. PROGRAM DESCRIPTION

THIS PROGRAM IS A STRAIGHT LINE TEST OF THE
EAE FUNCTIONS STARTING WITH A TEST OF THE REGISTERS.
THE TEST IS ACTUALLY A CLUSTER OF SUB-TESTS SEPERATED
BY 'SCOPE'. THESE SUB-TESTS ARE EXECUTED 4000 TIMES
BEFORE GOING ON TO THE NEXT TEST. SW11 INHIBITS THIS
SO THAT EACH SUB-TEST IS EXECUTED ONLY ONCE PER PASS.
SW14 CAUSES THE CURRENT SUB-TEST TO BE LOOPED ON.

THE PROGRAM STARTS OFF BY CHECKING THE REGISTERS
FOR WRITABILITY. THE NEXT SECTION CHECKS OUT THE
LOGICAL SHIFT INSTRUCTION. THIS SECTION IS THE BULK
OF THE PROGRAM BECAUSE IT IS THE MOST BASIC TEST OF THE
SHIFT REGISTER. THIS SECTION CHECKS THE LOGICAL SHIFTS
FROM 0-16 TIMES OF 0'S, 1'S, AND ALTERNATE 0'S AND 1'S
PLUS SPECIAL CASES OF BOTH LEFT AND RIGHT SHIFTING.
THE REST OF THE PROGRAM TESTS SPECIAL CASES OF ARITH-
METIC SHIFT, NORMALIZE, MULTIPLY, AND DIVIDE.

10. LISTING

FOLLOWING

11. FLOW CHART(S)

NA

%

```
;;*****************************************************************
;;*****************************************************************
.TITLE  MAINDEC-11-DZKEB-B
;*COPYRIGHT (C) 1970,1977
;*DIGITAL EQUIPMENT CORP.
;*MAYNARD, MASS. 01754
;*
;*PROGRAM BY BOB BRAIN
;*
;*
;*MODIFIED BY ALAN BOSTICK, JULY 1976 TO SUPPORT
;*SOFTWARE SWITCH REGISTER.
;*ALSO ALLOWS DYNAMIC LOADING OF SOFTWARE SWITCH
;*REGISTER FROM TTY
;;*****************************************************************

;       SWITCH SETTINGS

;               SWITCH          USE
;               ------          ---------------------------------
;                 00            INHIBIT SHIFT AND NORMALIZE TEST
;                 01            INHIBIT MULTIPLY AND DIVIDE TEST
;                 10            0 - BELL ON PASS COMPLETE
;                               1 - BELL ON ERROR
;                 11            INHIBIT ITERATIONS
;                 12            INHIBIT TRACE TRAP
;                 13            INHIBIT TYPEOUT
;                 14            LOOP ON TEST
;                 15            HALT ON ERROR
;;*****************************************************************
;;*****************************************************************
```

```
                    000000                  .=0
                    000030                  .=30
000030  016366                              PRINT
000032  000340                              340
                    000034                  .=34
000034  017254                              SCOPEC
000036  000000                              0
                    000040                  .=40
000040  000000                              0
000042  000000                              0
000044  000000                              0
                    000046                  .=46
000046  016222                              $ENDAD
                    000050                  .=50
000050  000000                              0
                    000052                  .=52
000052  000000                              0
                    104000          HLT     =       EMT
                    177776          PSW=    177776
                    000240          NOP=    240
                    104400          SCOPE=  TRAP
                    000174                  .=174
000174  177570                      SWR:    177570
                    000176                  .=176
000176  000000                      SWREG:  0
                    000200                  .=200
000200  012706  017406              MOV     #BUFF,%6        ;SET UP STACK FOR SCOPE LOOP
000204  022737  016222  000042      CMP     #$ENDAD,@#42    ;CHECK FOR AUTO MODE
000212  001411                      BEQ     1$              ;YES, DO NOT TYPE TITLE
000214  005005                      CLR     %5
000216  012705  020075              MOV     #$HEAD,%5       ;TYPE PROGRAM NAME
000222  004767  017676              JSR     %7,TTOUT
000226  012705  020046              MOV     #$MAIN,%5       ; TYPE MAINDEC NUMBER
000232  004767  017666              JSR     %7,TTOUT
000236  000167  000022              JMP     SUSWR
000242  177300                      DIV:    177300
000244  177302                      AC:     177302
000246  177304                      MQ:     177304
000250  177306                      MUL:    177306
000252  177310                      SC:     177310
000254  177311                      SR:     177311
000256  177312                      NOR:    177312
000260  177314                      LSH:    177314
000262  177316                      ASH:    177316


                    ;;**********************************************************************
                    ;       TEST FOR HARDWARE SWITCH REGISTER
                    ;;**********************************************************************

000264  013746  000006      SUSWR:  MOV     @#6,-(6)        ;SAVE VECTORS
000270  013746  000004              MOV     @#4,-(6)
000274  012737  000314  000004      MOV     #64$,@#4        ;SET UP FOR TIMEOUT
000302  022777  177777  177664      CMP     #-1,@SWR        ;REFERENCE HARDWARE SWITCH REGISTER
000310  001402                      BEQ     65$
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     91  000312  000404                          BR      66$
     92  000314  022626                  64$:    CMP     (6)+,(6)+       ;ADJUST STACK
     93  000316  012767  000176  177650  65$:    MOV     #SWREG,SWR      ;POINT TO SOFTWARE SWITCH REG
     94  000324  012637  000004          66$:    MOV     (6)+,@#4        ;RESTORE VECTORS
     95  000330  012637  000006          MOV     (6)+,@#6
     96  000334  022767  000176  177632  CMP     #SWREG,SWR      ;IS SWREG USED
     97  000342  001006                  BNE     BEGIN
     98  000344  022737  016222  000042  CMP     #$ENDAD,@#42    ;CHECK FOR AUTO MODE
     99  000352  001402                  BEQ     BEGIN           ;YES, ASSUME WORST CASE
    100  000354  004767  017114          JSR     %7,CNTLU        ;ALLOW SWREG TO BE LOADED
    101  000360  012767  000360  016750  BEGIN:  MOV     #BEGIN,RETURN   ;SET UP RESTART OF PROGRAM
    102  000366  005077  177652          CLR     @AC
    103  000372  005077  177650          CLR     @MQ
    104  000376  005003                  CLR     %3
```

```
                                ;;*****************************************************************
                                ;       REGISTER TEST FOR WRITABILITY
                                ;;*****************************************************************
000400                          REGWRI:
000400  104400                          SCOPE                           ;CHECK SR AND SC FLOPS FOR 0 STATE
000402  012777  000000  177642          MOV     #0,@SC
000410  105777  177636                  TSTB    @SC
000414  001401                          BEQ     64$             ;IF NO.ERROR SKIP HLT
000416  104000                          HLT                     ;CALL ERROR ROUTINE
000420                          64$:
000420  104400                          SCOPE                           ;CHECK SR AND SC FLOPS FOR 1 STATE
000422  012777  140477  177622          MOV     #140477,@SC
000430  017746  177616                  MOV     @SC,-(6)
000434  042716  037300                  BIC     #37300,(6)
000440  022726  140477                  CMP     #140477,(6)+
000444  001401                          BEQ     65$             ;IF NO.ERROR SKIP HLT
000446  104000                          HLT                     ;CALL ERROR ROUTINE
000450                          65$:
000450  005077  177576                  CLR     @SC
                                
000454  104400                          SCOPE                           ;CHECK MQ FLOPS FOR 0 STATE
000456  012777  000000  177562          MOV     #0,@MQ
000464  005777  177556                  TST     @MQ
000470  001401                          BEQ     66$             ;IF NO.ERROR SKIP HLT
000472  104000                          HLT                     ;CALL ERROR ROUTINE
000474                          66$:
                                
000474  122777  000036  177552          CMPB    #36,@SR                 ;CHECK STATUS 36
000502  001401                          BEQ     67$             ;IF NO.ERROR SKIP HLT
000504  104000                          HLT                     ;CALL ERROR ROUTINE
000506                          67$:
                                
000506  104400                          SCOPE                           ;CHECK MQ FLOPS FOR 1 STATE
000510  012777  177777  177530          MOV     #-1,@MQ
000516  022777  177777  177522          CMP     #-1,@MQ
000524  001401                          BEQ     68$             ;IF NO.ERROR SKIP HLT
000526  104000                          HLT                     ;CALL ERROR ROUTINE
000530                          68$:
                                
000530  122777  000042  177516          CMPB    #42,@SR                 ;CHECK STATUS 42
000536  001401                          BEQ     69$             ;IF NO.ERROR SKIP HLT
000540  104000                          HLT                     ;CALL ERROR ROUTINE
000542                          69$:
000542  104400                          SCOPE                           ;CHECK AC FLOPS FOR 0 STATE
000544  012777  000000  177472          MOV     #0,@AC
000552  005777  177466                  TST     @AC
000556  001401                          BEQ     70$             ;IF NO.ERROR SKIP HLT
000560  104000                          HLT                     ;CALL ERROR ROUTINE
000562                          70$:
                                
000562  122777  000020  177464          CMPB    #20,@SR                 ;CHECK STATUS 20
000570  001401                          BEQ     71$             ;IF NO.ERROR SKIP HLT
000572  104000                          HLT                     ;CALL ERROR ROUTINE
000574                          71$:
```

```
                                SCOPE                   ;CHECK AC FLOPS FOR 1 STATE
000574  104400
000576  012777  177777  177440    MOV     #-1,@AC
000604  022777  177777  177432    CMP     #-1,@AC
000612  001401                    BEQ     72$         ;IF NO.ERROR SKIP HLT
000614  104000                    HLT                 ;CALL ERROR ROUTINE
000616                          72$:
000616  122777  000042  177430    CMPB    #42,@SR             ;CHECK STATUS 42
000624  001401                    BEQ     73$         ;IF NO.ERROR SKIP HLT
000626  104000                    HLT                 ;CALL ERROR ROUTINE
000630                          73$:

000630  104400                    SCOPE               ;CHECK AC AND MQ WITH ALL NUMBERS
000632  005067  016552            CLR     CP
000636  005267  016546          CP1:  INC     CP
000642  001420                    BEQ     OUTPC               ;FINISHED WHEN CP=0
000644  016777  016540  177374    MOV     CP,@MQ              ;LOAD MQ
000652  026777  016532  177366    CMP     CP,@MQ              ;TEST MQ
000660  001401                    BEQ     64$         ;IF NO.ERROR SKIP HLT
000662  104000                    HLT                 ;CALL ERROR ROUTINE
000664                          64$:
000664  016777  016520  177352    MOV     CP,@AC              ;LOAD AC
000672  026777  016512  177344    CMP     CP,@AC              ;TEST AC
000700  001756                    BEQ     CP1
000702  104000                    HLT                 ;HALT IF AC.NE.CP
000704  012767  004000  016422  OUTPC: MOV    #4000,SCOPEF        ;NO ITERATIONS
000712  104400                    SCOPE               ;TEST OF SIGN EXTENTION
000714  012777  177777  177324    MOV     #-1,@MQ             ;LOAD MQ WITH -1
000722  022777  177777  177314    CMP     #-1,@AC             ;TEST FOR SIGN EXTENTION
000730  001401                    BEQ     64$         ;IF NO.ERROR SKIP HLT
000732  104000                    HLT                 ;CALL ERROR ROUTINE
000734                          64$:

000734  005077  177306            CLR     @MQ                 ;CHECK FOR ZERO SIGN EXTENTION
000740  005777  177300            TST     @AC                 ;CHECK FOR ZERO AC
000744  001401                    BEQ     65$         ;IF NO.ERROR SKIP HLT
000746  104000                    HLT                 ;CALL ERROR ROUTINE
000750                          65$:

000750  112777  177777  177270    MOVB    #-1,@MQ             ;TEST OF BYTE SIGN EXTENTION
000756  022777  177777  177262    CMP     #-1,@MQ             ;CHECK FOR SIGN EXTENTION IN MQ
000764  001401                    BEQ     66$         ;IF NO.ERROR SKIP HLT
000766  104000                    HLT                 ;CALL ERROR ROUTINE
000770                          66$:
000770  022777  177777  177246    CMP     #-1,@AC             ;CHECK FOR SIGN EXTENTION IN AC
```

```
                                        BEQ     67$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                67$:
                                
                                        CLRB    @MQ                     ;CHECK FOR BYTE ZERO SIGN EXTENTION
                                        TST     @MQ                     ;CHECK FOR ZERO MQ
                                        BEQ     68$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                68$:
                                        TST     @AC                     ;CHECK FOR ZERO AC
                                        BEQ     69$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                69$:
                                
                                        MOV     #100000,@MQ             ;LOAD MQ WITH LARGEST NUMBER
                                        CMP     #-1,@AC                 ;DID IT SIGN EXTEND
                                        BEQ     70$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                70$:
                                        MOVB    #200,@MQ                ;LOAD MQ WITH LARGEST BYTE
                                        CMP     #-1,@AC                 ;DID IT SIGN EXTEND
                                        BEQ     71$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                71$:
                                        CMP     #177600,@MQ             ;DID IT SIGN EXTEND
                                        BEQ     72$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                72$:
                                
                                        MOV     #77,@SC                 ;LOAD SC WITH -1
                                        CMP     #77,@NOR                ;CHECK FOR SIGN EXTENTION
                                        BEQ     73$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                73$:
                                
                                        CLR     @SC                     ;CLEAR SC
                                        TST     @NOR                    ;CHECK NOR
                                        BEQ     74$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                74$:
                                
                                ;;*****************************************************************
                                ;       AT THIS POINT, ALL THE REGISTERS CAN HANDLE DATA OF
                                ;       ANY FORM
                                ;;*****************************************************************
                                        JSR     %7,CKSWR                ;CHECK FOR CONT-G
                                        BIT     #1,@SWR
                                        BEQ     MQOL
                                        JMP     .DIV
```

```
                                ;;*****************************************************************
                                ;       LOGICAL SHIFT TEST SECTION
                                ;       TEST MQ SHIFT OF 0'S LEFT
                                ;;*****************************************************************
001154                          MQOL:
001154  104400                          SCOPE
001156  005077  177062                   CLR     @AC
001162  005077  177060                   CLR     @MQ
001166  012700  177777                   MOV     #-1,%0
001172  005200                  LOOP:    INC     %0
001174  005077  177052                   CLR     @SC                     ;CLEAR SR AND SC
001200  010077  177054                   MOV     %0,@LSH                 ;SHIFT R0 TIMES LEFT
001204  005777  177036                   TST     @MQ                     ;TEST MQ FOR '0'
001210  001401                          BEQ     64$             ;IF NO.ERROR SKIP HLT
001212  104000                          HLT                     ;CALL ERROR ROUTINE
001214                          64$:
001214  122777  000036  177032           CMPB    #36,@SR                 ;CHECK STATUS REGISTER
001222  001401                          BEQ     65$             ;IF NO.ERROR SKIP HLT
001224  104000                          HLT                     ;CALL ERROR ROUTINE
001226                          65$:
001226  022700  000020                   CMP     #16.,%0                 ;LAST ONE
001232  001357                          BNE     LOOP

                                ;;*****************************************************************
                                ;       TEST AC SHIFT OF 0'S RIGHT
                                ;;*****************************************************************
001234  104400                          SCOPE
001236  012700  000001                   MOV     #1,%0
001242  005300                  LOOP1:   DEC     %0
001244  005077  177002                   CLR     @SC                     ;CLEAR SR AND SC
001250  010077  177004                   MOV     %0,@LSH                 ;SHIFT R0 TIMES RIGHT
001254  005777  176764                   TST     @AC                     ;TEST AC FOR '0'
001260  001401                          BEQ     64$             ;IF NO.ERROR SKIP HLT
001262  104000                          HLT                     ;CALL ERROR ROUTINE
001264                          64$:
001264  122777  000036  176762           CMPB    #36,@SR                 ;CHECK STATUS REGISTER
001272  001401                          BEQ     65$             ;IF NO.ERROR SKIP HLT
001274  104000                          HLT                     ;CALL ERROR ROUTINE
001276                          65$:
001276  022700  177760                   CMP     #-16.,%0                ;LAST ONE
001302  001357                          BNE     LOOP1
```

```
                                ;;*****************************************************************
                                ;       TEST MQ SHIFT OF 1'S RIGHT
                                ;;*****************************************************************
001304                  MQ1R:
001304  104400                         SCOPE
001306  012777  177777  176732         MOV     #-1,@MQ                 ;SET MQ=-1
001314  005077  176724                 CLR     @AC                     ;CLEAR AC
001320  005077  176734                 CLR     @LSH                    ;INITALIZE SHIFT BY 0
001324  027727  176716  177777         CMP     @MQ,#-1                 ;COMPARE UNSHIFTED MQ TO -1
001332  001401                         BEQ     64$             ;IF NO.ERROR SKIP HLT
001334  104000                         HLT                     ;CALL ERROR ROUTINE
001336                  64$:
001336  122777  000020  176710         CMPB    #20,@SR                 ;CHECK STATUS
001344  001401                         BEQ     65$             ;IF NO.ERROR SKIP HLT
001346  104000                         HLT                     ;CALL ERROR ROUTINE
001350                  65$:
001350  104400                         SCOPE
001352  012777  177777  176666         MOV     #-1,@MQ                 ;RESET MQ
001360  005077  176660                 CLR     @AC
001364  012777  177777  176666         MOV     #177777,@LSH            ;SHIFT 177777 TIMES RIGHT
001372  022777  077777  176646         CMP     #77777,@MQ                      ;CHECK MQ
001400  001401                         BEQ     66$             ;IF NO.ERROR SKIP HLT
001402  104000                         HLT                     ;CALL ERROR ROUTINE
001404                  66$:
001404  122777  000023  176642         CMPB    #23,@SR                 ;CHECK STATUS
001412  001401                         BEQ     67$             ;IF NO.ERROR SKIP HLT
001414  104000                         HLT                     ;CALL ERROR ROUTINE
001416                  67$:
001416  104400                         SCOPE
001420  012777  177777  176620         MOV     #-1,@MQ                 ;RESET MQ
001426  005077  176612                 CLR     @AC
001432  012777  177776  176620         MOV     #177776,@LSH            ;SHIFT 177776 TIMES RIGHT
001440  022777  037777  176600         CMP     #37777,@MQ                      ;CHECK MQ
001446  001401                         BEQ     68$             ;IF NO.ERROR SKIP HLT
001450  104000                         HLT                     ;CALL ERROR ROUTINE
001452                  68$:
001452  122777  000023  176574         CMPB    #23,@SR                 ;CHECK STATUS
001460  001401                         BEQ     69$             ;IF NO.ERROR ROUTINE
001462  104000                         HLT                     ;CALL ERROR ROUTINE
001464                  69$:

001464  104400                         SCOPE
001466  012777  177777  176552         MOV     #-1,@MQ                 ;RESET MQ
001474  005077  176544                 CLR     @AC
001500  012777  177775  176552         MOV     #177775,@LSH            ;SHIFT 177775 TIMES RIGHT
001506  022777  017777  176532         CMP     #17777,@MQ                      ;CHECK MQ
001514  001401                         BEQ     70$             ;IF NO.ERROR SKIP HLT
001516  104000                         HLT                     ;CALL ERROR ROUTINE
001520                  70$:
001520  122777  000023  176526         CMPB    #23,@SR                 ;CHECK STATUS
001526  001401                         BEQ     71$             ;IF NO.ERROR SKIP HLT
001530  104000                         HLT                     ;CALL ERROR ROUTINE
001532                  71$:
001532  104400                         SCOPE
001534  012777  177777  176504         MOV     #-1,@MQ                 ;RESET MQ
```

```
  353  001542  005077  176476                CLR     @AC
  354  001546  012777  177774  176504        MOV     #177774,@LSH            ;SHIFT 177774 TIMES RIGHT
  355  001554  022777  007777  176464        CMP     #7777,@MQ                       ;CHECK MQ
  356  001562  001401                        BEQ     72$             ;IF NO.ERROR SKIP HLT
  357  001564  104000                        HLT                     ;CALL ERROR ROUTINE
  358  001566                          72$:
  359  001566  122777  000023  176460        CMPB    #23,@SR                 ;CHECK STATUS
  360  001574  001401                        BEQ     73$             ;IF NO.ERROR SKIP HLT
  361  001576  104000                        HLT                     ;CALL ERROR ROUTINE
  362  001600                          73$:
  363
  364  001600  104400                        SCOPE
  365  001602  012777  177777  176436        MOV     #-1,@MQ                 ;RESET MQ
  366  001610  005077  176430                CLR     @AC
  367  001614  012777  177773  176436        MOV     #177773,@LSH            ;SHIFT 177773 TIMES RIGHT
  368  001622  000241                        CLC
  369  001624  022777  003777  176414        CMP     #3777,@MQ                       ;CHECK MQ
  370  001632  001401                        BEQ     74$             ;IF NO.ERROR SKIP HLT
  371  001634  104000                        HLT                     ;CALL ERROR ROUTINE
  372  001636                          74$:
  373  001636  122777  000023  176410        CMPB    #23,@SR                 ;CHECK STATUS
  374  001644  001401                        BEQ     75$             ;IF NO.ERROR SKIP HLT
  375  001646  104000                        HLT                     ;CALL ERROR ROUTINE
  376  001650                          75$:
  377
  378  001650  104400                        SCOPE
  379  001652  012777  177777  176366        MOV     #-1,@MQ                 ;RESET MQ
  380  001660  005077  176360                CLR     @AC
  381  001664  012777  177772  176366        MOV     #177772,@LSH            ;SHIFT 177772 TIMES RIGHT
  382  001672  022777  001777  176346        CMP     #1777,@MQ                       ;CHECK MQ
  383  001700  001401                        BEQ     76$             ;IF NO.ERROR SKIP HLT
  384  001702  104000                        HLT                     ;CALL ERROR ROUTINE
  385  001704                          76$:
  386  001704  122777  000023  176342        CMPB    #23,@SR                 ;CHECK STATUS
  387  001712  001401                        BEQ     77$             ;IF NO.ERROR SKIP HLT
  388  001714  104000                        HLT                     ;CALL ERROR ROUTINE
  389  001716                          77$:
  390  001716  104400                        SCOPE
  391  001720  012777  177777  176320        MOV     #-1,@MQ                 ;RESET MQ
  392  001726  005077  176312                CLR     @AC
  393  001732  012777  177771  176320        MOV     #177771,@LSH            ;SHIFT 177771 TIMES RIGHT
  394  001740  022777  000777  176300        CMP     #777,@MQ                        ;CHECK MQ
  395  001746  001401                        BEQ     78$             ;IF NO.ERROR SKIP HLT
  396  001750  104000                        HLT                     ;CALL ERROR ROUTINE
  397  001752                          78$:
  398  001752  122777  000023  176274        CMPB    #23,@SR                 ;CHECK STATUS
```

```
                                        BEQ     79$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                79$:
                                        SCOPE
001760  001401                          MOV     #-1,@MQ                 ;RESET MQ
001762  104000                          CLR     @AC
001764                          79$:    SCOPE
001764  104400                          MOV     #-1,@MQ                 ;RESET MQ
001766  012777  177777  176252          CLR     @AC
001774  005077  176244                  MOV     #177770,@LSH            ;SHIFT 177770 TIMES RIGHT
002000  012777  177770  176252          CMP     #377,@MQ                        ;CHECK MQ
002006  022777  000377  176232          BEQ     80$             ;IF NO.ERROR SKIP HLT
002014  001401                          HLT                     ;CALL ERROR ROUTINE
002016  104000                  80$:
002020                          80$:    CMPB    #23,@SR                 ;CHECK STATUS
002020  122777  000023  176226          BEQ     81$             ;IF NO.ERROR SKIP HLT
002026  001401                          HLT                     ;CALL ERROR ROUTINE
002030  104000                  81$:
002032                          81$:    SCOPE
002032  104400                          MOV     #-1,@MQ                 ;RESET MQ
002034  012777  177777  176204          CLR     @AC
002042  005077  176176                  MOV     #177767,@LSH            ;SHIFT 177767 TIMES RIGHT
002046  012777  177767  176204          CMP     #177,@MQ                        ;CHECK MQ
002054  022777  000177  176164          BEQ     82$             ;IF NO.ERROR SKIP HLT
002062  001401                          HLT                     ;CALL ERROR ROUTINE
002064  104000                  82$:
002066                          82$:    CMPB    #23,@SR                 ;CHECK STATUS
002066  122777  000023  176160          BEQ     83$             ;IF NO.ERROR SKIP HLT
002074  001401                          HLT                     ;CALL ERROR ROUTINE
002076  104000                  83$:
002100                          83$:    SCOPE
002100  104400                          MOV     #-1,@MQ                 ;RESET MQ
002102  012777  177777  176136          CLR     @AC
002110  005077  176130                  MOV     #177766,@LSH            ;SHIFT 177766 TIMES RIGHT
002114  012777  177766  176136          CMP     #77,@MQ                         ;CHECK MQ
002122  022777  000077  176116          BEQ     84$             ;IF NO.ERROR SKIP HLT
002130  001401                          HLT                     ;CALL ERROR ROUTINE
002132  104000                  84$:
002134                          84$:    CMPB    #23,@SR                 ;CHECK STATUS
002134  122777  000023  176112          BEQ     85$             ;IF NO.ERROR SKIP HLT
002142  001401                          HLT                     ;CALL ERROR ROUTINE
002144  104000                  85$:
002146                          85$:    SCOPE
002146  104400                          MOV     #-1,@MQ                 ;RESET MQ
002150  012777  177777  176070          CLR     @AC
002156  005077  176062                  MOV     #177765,@LSH            ;SHIFT 177765 TIMES RIGHT
002162  012777  177765  176070          CMP     #37,@MQ                         ;CHECK MQ
002170  022777  000037  176050          BEQ     86$             ;IF NO.ERROR SKIP HLT
002176  001401                          HLT                     ;CALL ERROR ROUTINE
002200  104000                  86$:
002202                          86$:    CMPB    #23,@SR                 ;CHECK STATUS
002202  122777  000023  176044
```

```
    450  002210  001401                        BEQ     87$             ;IF NO.ERROR SKIP HLT
    451  002212  104000                        HLT                     ;CALL ERROR ROUTINE
    452  002214                          87$:
    453  002214  104400                        SCOPE
    454  002216  012777  177777  176022        MOV     #-1,@MQ                 ;RESET MQ
    455  002224  005077  176014                CLR     @AC
    456  002230  012777  177764  176022        MOV     #177764,@LSH            ;SHIFT 177764 TIMES RIGHT
    457  002236  022777  000017  176002        CMP     #17,@MQ                         ;CHECK MQ
    458  002244  001401                        BEQ     88$             ;IF NO.ERROR SKIP HLT
    459  002246  104000                        HLT                     ;CALL ERROR ROUTINE
    460  002250                          88$:
    461  002250  122777  000023  175776        CMPB    #23,@SR                 ;CHECK STATUS
    462  002256  001401                        BEQ     89$             ;IF NO.ERROR SKIP HLT
    463  002260  104000                        HLT                     ;CALL ERROR ROUTINE
    464  002262                          89$:
    465
    466  002262  104400                        SCOPE
    467  002264  012777  177777  175754        MOV     #-1,@MQ                 ;RESET MQ
    468  002272  005077  175746                CLR     @AC
    469  002276  012777  177763  175754        MOV     #177763,@LSH            ;SHIFT 177763 TIMES RIGHT
    470  002304  022777  000007  175734        CMP     #7,@MQ                          ;CHECK MQ
    471  002312  001401                        BEQ     90$             ;IF NO.ERROR SKIP HLT
    472  002314  104000                        HLT                     ;CALL ERROR ROUTINE
    473  002316                          90$:
    474  002316  122777  000023  175730        CMPB    #23,@SR                 ;CHECK STATUS
    475  002324  001401                        BEQ     91$             ;IF NO.ERROR SKIP HLT
    476  002326  104000                        HLT                     ;CALL ERROR ROUTINE
    477  002330                          91$:
    478
    479  002330  104400                        SCOPE
    480  002332  012777  177777  175706        MOV     #-1,@MQ                 ;RESET MQ
    481  002340  005077  175700                CLR     @AC
    482  002344  012777  177762  175706        MOV     #177762,@LSH            ;SHIFT 177762 TIMES RIGHT
    483  002352  022777  000003  175666        CMP     #3,@MQ                          ;CHECK MQ
    484  002360  001401                        BEQ     92$             ;IF NO.ERROR SKIP HLT
    485  002362  104000                        HLT                     ;CALL ERROR ROUTINE
    486  002364                          92$:
    487  002364  122777  000023  175662        CMPB    #23,@SR                 ;CHECK STATUS
    488  002372  001401                        BEQ     93$             ;IF NO.ERROR SKIP HLT
    489  002374  104000                        HLT                     ;CALL ERROR ROUTINE
    490  002376                          93$:
    491
    492  002376  104400                        SCOPE
    493  002400  012777  177777  175640        MOV     #-1,@MQ                 ;RESET MQ
    494  002406  005077  175632                CLR     @AC
    495  002412  012777  177761  175640        MOV     #177761,@LSH            ;SHIFT 177761 TIMES RIGHT
    496  002420  022777  000001  175620        CMP     #1,@MQ                          ;CHECK MQ
    497  002426  001401                        BEQ     94$             ;IF NO.ERROR SKIP HLT
    498  002430  104000                        HLT                     ;CALL ERROR ROUTINE
    499  002432                          94$:
    500  002432  122777  000023  175614        CMPB    #23,@SR                 ;CHECK STATUS
    501  002440  001401                        BEQ     95$             ;IF NO.ERROR SKIP HLT
    502  002442  104000                        HLT                     ;CALL ERROR ROUTINE
    503  002444                          95$:
```

```
                                        ;;*****************************************************************
                                        ;       TEST AC SHIFT OF 1'S LEFT
                                        ;*****************************************************************
002444                          AC1L:
002444  104400                         SCOPE
002446  005077  175574                 CLR     @MQ
002452  012777  177777  175564         MOV     #-1,@AC                 ;SET AC=-1
002460  005077  175574                 CLR     @LSH                    ;INITALIZE SHIFT BY 0
002464  027727  175554  177777         CMP     @AC,#-1                 ;COMPARE UNSHIFTED AC TO -1
002472  001401                         BEQ     64$             ;IF NO.ERROR SKIP HLT
002474  104000                         HLT                     ;CALL ERROR ROUTINE
002476                          64$:
002476  122777  000350  175550         CMPB    #350,@SR                ;CHECK STATUS
002504  001401                         BEQ     65$             ;IF NO.ERROR SKIP HLT
002506  104000                         HLT                     ;CALL ERROR ROUTINE
002510                          65$:
002510  104400                         SCOPE
002512  012777  177777  175524         MOV     #-1,@AC                 ;SET AC=-1
002520  012777  000001  175532         MOV     #1,@LSH                 ;SHIFT 1 TIMES LEFT
002526  022777  177776  175510         CMP     #177776,@AC             ;CHECK AC
002534  001401                         BEQ     66$             ;IF NO.ERROR SKIP HLT
002536  104000                         HLT                     ;CALL ERROR ROUTINE
002540                          66$:
002540  122777  000311  175506         CMPB    #311,@SR                ;CHECK STATUS
002546  001401                         BEQ     67$             ;IF NO.ERROR SKIP HLT
002550  104000                         HLT                     ;CALL ERROR ROUTINE
002552                          67$:

002552  104400                         SCOPE
002554  012777  177777  175462         MOV     #-1,@AC                 ;SET AC=-1
002562  012777  000002  175470         MOV     #2,@LSH                 ;SHIFT 2 TIMES LEFT
002570  022777  177774  175446         CMP     #177774,@AC             ;CHECK AC
002576  001401                         BEQ     68$             ;IF NO.ERROR SKIP HLT
002600  104000                         HLT                     ;CALL ERROR ROUTINE
002602                          68$:
002602  122777  000311  175444         CMPB    #311,@SR                ;CHECK STATUS
002610  001401                         BEQ     69$             ;IF NO.ERROR SKIP HLT
002612  104000                         HLT                     ;CALL ERROR ROUTINE
002614                          69$:

002614  104400                         SCOPE
002616  012777  177777  175420         MOV     #-1,@AC                 ;SET AC=-1
002624  012777  000003  175426         MOV     #3,@LSH                 ;SHIFT 3 TIMES LEFT
002632  022777  177770  175404         CMP     #177770,@AC             ;CHECK AC
002640  001401                         BEQ     70$             ;IF NO.ERROR SKIP HLT
002642  104000                         HLT                     ;CALL ERROR ROUTINE
002644                          70$:
002644  122777  000311  175402         CMPB    #311,@SR                ;CHECK STATUS
002652  001401                         BEQ     71$             ;IF NO.ERROR SKIP HLT
002654  104000                         HLT                     ;CALL ERROR ROUTINE
002656                          71$:
002656  104400                         SCOPE
002660  012777  177777  175356         MOV     #-1,@AC                 ;SET AC=-1
002666  012777  000004  175364         MOV     #4,@LSH                 ;SHIFT 4 TIMES LEFT
```

```
  560  002674  022777  177760  175342          CMP     #177760,@AC             ;CHECK AC
  561  002702  001401                          BEQ     72$             ;IF NO.ERROR SKIP HLT
  562  002704  104000                          HLT                     ;CALL ERROR ROUTINE
  563  002706                          72$:
  564  002706  122777  000311  175340          CMPB    #311,@SR                ;CHECK STATUS
  565  002714  001401                          BEQ     73$             ;IF NO.ERROR SKIP HLT
  566  002716  104000                          HLT                     ;CALL ERROR ROUTINE
  567  002720                          73$:
  568
  569
  570  002720  104400                          SCOPE
  571  002722  012777  177777  175314          MOV     #-1,@AC                 ;SET AC=-1
  572  002730  012777  000005  175322          MOV     #5,@LSH                 ;SHIFT 5 TIMES LEFT
  573  002736  022777  177740  175300          CMP     #177740,@AC             ;CHECK AC
  574  002744  001401                          BEQ     74$             ;IF NO.ERROR SKIP HLT
  575  002746  104000                          HLT                     ;CALL ERROR ROUTINE
  576  002750                          74$:
  577  002750  122777  000311  175276          CMPB    #311,@SR                ;CHECK STATUS
  578  002756  001401                          BEQ     75$             ;IF NO.ERROR SKIP HLT
  579  002760  104000                          HLT                     ;CALL ERROR ROUTINE
  580  002762                          75$:
  581
  582  002762  104400                          SCOPE
  583  002764  012777  177777  175252          MOV     #-1,@AC                 ;SET AC=-1
  584  002772  012777  000006  175260          MOV     #6,@LSH                 ;SHIFT 6 TIMES LEFT
  585  003000  022777  177700  175236          CMP     #177700,@AC             ;CHECK AC
  586  003006  001401                          BEQ     76$             ;IF NO.ERROR SKIP HLT
  587  003010  104000                          HLT                     ;CALL ERROR ROUTINE
  588  003012                          76$:
  589  003012  122777  000311  175234          CMPB    #311,@SR                ;CHECK STATUS
  590  003020  001401                          BEQ     77$             ;IF NO.ERROR SKIP HLT
  591  003022  104000                          HLT                     ;CALL ERROR ROUTINE
  592  003024                          77$:
  593
  594
  595  003024  104400                          SCOPE
  596  003026  012777  177777  175210          MOV     #-1,@AC                 ;SET AC=-1
  597  003034  012777  000007  175216          MOV     #7,@LSH                 ;SHIFT 7 TIMES LEFT
  598  003042  022777  177600  175174          CMP     #177600,@AC             ;CHECK AC
  599  003050  001401                          BEQ     78$             ;IF NO.ERROR SKIP HLT
  600  003052  104000                          HLT                     ;CALL ERROR ROUTINE
  601  003054                          78$:
  602  003054  122777  000311  175172          CMPB    #311,@SR                ;CHECK STATUS
```

```
                                        BEQ     79$             ;IF NO.ERROR SKIP HLT
003064  104000                          HLT                     ;CALL ERROR ROUTINE
003066                          79$:
003066  104400                          SCOPE
003070  012777  177777  175146          MOV     #-1,@AC                 ;SET AC=-1
003076  012777  000010  175154          MOV     #10,@LSH                ;SHIFT 10 TIMES LEFT
003104  022777  177400  175132          CMP     #177400,@AC             ;CHECK AC
003112  001401                          BEQ     80$             ;IF NO.ERROR SKIP HLT
003114  104000                          HLT                     ;CALL ERROR ROUTINE
003116                          80$:
003116  122777  000311  175130          CMPB    #311,@SR                ;CHECK STATUS
003124  001401                          BEQ     81$             ;IF NO.ERROR SKIP HLT
003126  104000                          HLT                     ;CALL ERROR ROUTINE
003130                          81$:


003130  104400                          SCOPE
003132  012777  177777  175104          MOV     #-1,@AC                 ;SET AC=-1
003140  012777  000011  175112          MOV     #11,@LSH                ;SHIFT 11 TIMES LEFT
003146  022777  177000  175070          CMP     #177000,@AC             ;CHECK AC
003154  001401                          BEQ     82$             ;IF NO.ERROR SKIP HLT
003156  104000                          HLT                     ;CALL ERROR ROUTINE
003160                          82$:
003160  122777  000311  175066          CMPB    #311,@SR                ;CHECK STATUS
003166  001401                          BEQ     83$             ;IF NO.ERROR SKIP HLT
003170  104000                          HLT                     ;CALL ERROR ROUTINE
003172                          83$:


003172  104400                          SCOPE
003174  012777  177777  175042          MOV     #-1,@AC                 ;SET AC=-1
003202  012777  000012  175050          MOV     #12,@LSH                ;SHIFT 12 TIMES LEFT
003210  022777  176000  175026          CMP     #176000,@AC             ;CHECK AC
003216  001401                          BEQ     84$             ;IF NO.ERROR SKIP HLT
003220  104000                          HLT                     ;CALL ERROR ROUTINE
003222                          84$:
003222  122777  000311  175024          CMPB    #311,@SR                ;CHECK STATUS
003230  001401                          BEQ     85$             ;IF NO.ERROR SKIP HLT
003232  104000                          HLT                     ;CALL ERROR ROUTINE
003234                          85$:


003234  104400                          SCOPE
003236  012777  177777  175000          MOV     #-1,@AC                 ;SET AC=-1
003244  012777  000013  175006          MOV     #13,@LSH                ;SHIFT 13 TIMES LEFT
003252  022777  174000  174764          CMP     #174000,@AC             ;CHECK AC
003260  001401                          BEQ     86$             ;IF NO.ERROR SKIP HLT
003262  104000                          HLT                     ;CALL ERROR ROUTINE
003264                          86$:
003264  122777  000311  174762          CMPB    #311,@SR                ;CHECK STATUS
```

```
                                        BEQ     87$             ;IF NO.ERROR SKIP HLT
003274  104000                          HLT                     ;CALL ERROR ROUTINE
003276                          87$:
003276  104400                          SCOPE
003300  012777  177777  174736          MOV     #-1,@AC                 ;SET AC=-1
003306  012777  000014  174744          MOV     #14,@LSH                ;SHIFT 14 TIMES LEFT
003314  022777  170000  174722          CMP     #170000,@AC             ;CHECK AC
003322  001401                          BEQ     88$             ;IF NO.ERROR SKIP HLT
003324  104000                          HLT                     ;CALL ERROR ROUTINE
003326                          88$:
003326  122777  000311  174720          CMPB    #311,@SR                ;CHECK STATUS
003334  001401                          BEQ     89$             ;IF NO.ERROR SKIP HLT
003336  104000                          HLT                     ;CALL ERROR ROUTINE
003340                          89$:


003340  104400                          SCOPE
003342  012777  177777  174674          MOV     #-1,@AC                 ;SET AC=-1
003350  012777  000015  174702          MOV     #15,@LSH                ;SHIFT 15 TIMES LEFT
003356  022777  160000  174660          CMP     #160000,@AC             ;CHECK AC
003364  001401                          BEQ     90$             ;IF NO.ERROR SKIP HLT
003366  104000                          HLT                     ;CALL ERROR ROUTINE
003370                          90$:
003370  122777  000311  174656          CMPB    #311,@SR                ;CHECK STATUS
003376  001401                          BEQ     91$             ;IF NO.ERROR SKIP HLT
003400  104000                          HLT                     ;CALL ERROR ROUTINE
003402                          91$:


003402  104400                          SCOPE
003404  012777  177777  174632          MOV     #-1,@AC                 ;SET AC=-1
003412  012777  000016  174640          MOV     #16,@LSH                ;SHIFT 16 TIMES LEFT
003420  022777  140000  174616          CMP     #140000,@AC             ;CHECK AC
003426  001401                          BEQ     92$             ;IF NO.ERROR SKIP HLT
003430  104000                          HLT                     ;CALL ERROR ROUTINE
003432                          92$:
003432  122777  000311  174614          CMPB    #311,@SR                ;CHECK STATUS
003440  001401                          BEQ     93$             ;IF NO.ERROR SKIP HLT
003442  104000                          HLT                     ;CALL ERROR ROUTINE
003444                          93$:


003444  104400                          SCOPE
003446  012777  177777  174570          MOV     #-1,@AC                 ;SET AC=-1
003454  012777  000017  174576          MOV     #17,@LSH                ;SHIFT 17 TIMES LEFT
003462  022777  100000  174554          CMP     #100000,@AC             ;CHECK AC
003470  001401                          BEQ     94$             ;IF NO.ERROR SKIP HLT
003472  104000                          HLT                     ;CALL ERROR ROUTINE
003474                          94$:
003474  122777  000311  174552          CMPB    #311,@SR                ;CHECK STATUS
003502  001401                          BEQ     95$             ;IF NO.ERROR SKIP HLT
003504  104000                          HLT                     ;CALL ERROR ROUTINE
003506                          95$:
```

```
                                ;;*****************************************************************
                                ;       TEST MQ SHIFT RIGHT OF ALTERNATE 1'S AND 0'S
                                ;;*****************************************************************

003506                          MQ1OR:
003506  104400                         SCOPE
003510  012777  125252  174530          MOV     #125252,@MQ             ;SET MQ=125252
003516  005077  174522                  CLR     @AC                     ;CLEAR AC
003522  005077  174532                  CLR     @LSH                    ;INITALIZE SHIFT BY 0
003526  027727  174514  125252          CMP     @MQ,#125252             ;COMPARE MQ
003534  001401                          BEQ     64$             ;IF NO.ERROR SKIP HLT
003536  104000                          HLT                     ;CALL ERROR ROUTINE
003540                          64$:
003540  122777  000020  174506          CMPB    #20,@SR                 ;CHECK STATUS
003546  001401                          BEQ     65$             ;IF NO.ERROR SKIP HLT
003550  104000                          HLT                     ;CALL ERROR ROUTINE
003552                          65$:

003552  104400                         SCOPE
003554  012777  125252  174464          MOV     #125252,@MQ             ;SET MQ=125252
003562  012777  177777  174470          MOV     #177777,@LSH            ;SHIFT 177777 TIMES
003570  105777  174460                  TSTB    @SR                     ;CHECK STATUS - NO CARRY
003574  001401                          BEQ     66$             ;IF NO.ERROR SKIP HLT
003576  104000                          HLT                     ;CALL ERROR ROUTINE
003600                          66$:
003600  022777  152525  174440          CMP     #152525,@MQ             ;COMPARE MQ
003606  001401                          BEQ     67$             ;IF NO.ERROR SKIP HLT
003610  104000                          HLT                     ;CALL ERROR ROUTINE
003612                          67$:

003612  104400                         SCOPE
003614  012777  125252  174424          MOV     #125252,@MQ             ;SET MQ=125252
003622  012777  177776  174430          MOV     #177776,@LSH            ;SHIFT 177776 TIMES
003630  122777  000001  174416          CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
003636  001401                          BEQ     68$             ;IF NO.ERROR SKIP HLT
003640  104000                          HLT                     ;CALL ERROR ROUTINE
003642                          68$:
003642  022777  165252  174376          CMP     #165252,@MQ             ;COMPARE MQ
003650  001401                          BEQ     69$             ;IF NO.ERROR SKIP HLT
003652  104000                          HLT                     ;CALL ERROR ROUTINE
003654                          69$:

003654  104400                         SCOPE
003656  012777  125252  174362          MOV     #125252,@MQ             ;SET MQ=125252
003664  012777  177775  174366          MOV     #177775,@LSH            ;SHIFT 177775 TIMES
003672  105777  174356                  TSTB    @SR                     ;CHECK STATUS - NO CARRY
003676  001401                          BEQ     70$             ;IF NO.ERROR SKIP HLT
003700  104000                          HLT                     ;CALL ERROR ROUTINE
003702                          70$:
003702  022777  172525  174336          CMP     #172525,@MQ             ;COMPARE MQ
003710  001401                          BEQ     71$             ;IF NO.ERROR SKIP HLT
003712  104000                          HLT                     ;CALL ERROR ROUTINE
003714                          71$:
003714  104400                         SCOPE
003716  012777  125252  174322          MOV     #125252,@MQ             ;SET MQ=125252
```

```
   761  003724  012777  177774  174326          MOV     #177774,@LSH            ;SHIFT 177774 TIMES
   762  003732  122777  000001  174314          CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
   763  003740  001401                          BEQ     72$             ;IF NO.ERROR SKIP HLT
   764  003742  104000                          HLT                     ;CALL ERROR ROUTINE
   765  003744                          72$:
   766  003744  022777  175252  174274          CMP     #175252,@MQ             ;COMPARE MQ
   767  003752  001401                          BEQ     73$             ;IF NO.ERROR SKIP HLT
   768  003754  104000                          HLT                     ;CALL ERROR ROUTINE
   769  003756                          73$:
   770  003756  104400                          SCOPE
   771  003760  012777  125252  174260          MOV     #125252,@MQ             ;SET MQ=125252
   772  003766  012777  177773  174264          MOV     #177773,@LSH            ;SHIFT 177773 TIMES
   773  003774  105777  174254                  TSTB    @SR                     ;CHECK STATUS - NO CARRY
   774  004000  001401                          BEQ     74$             ;IF NO.ERROR SKIP HLT
   775  004002  104000                          HLT                     ;CALL ERROR ROUTINE
   776  004004                          74$:
   777  004004  022777  176525  174234          CMP     #176525,@MQ             ;COMPARE MQ
   778  004012  001401                          BEQ     75$             ;IF NO.ERROR SKIP HLT
   779  004014  104000                          HLT                     ;CALL ERROR ROUTINE
   780  004016                          75$:
   781
   782  004016  104400                          SCOPE
   783  004020  012777  125252  174220          MOV     #125252,@MQ             ;SET MQ=125252
   784  004026  012777  177772  174224          MOV     #177772,@LSH            ;SHIFT 177772 TIMES
   785  004034  122777  000001  174212          CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
   786  004042  001401                          BEQ     76$             ;IF NO.ERROR SKIP HLT
   787  004044  104000                          HLT                     ;CALL ERROR ROUTINE
   788  004046                          76$:
   789  004046  022777  177252  174172          CMP     #177252,@MQ             ;COMPARE MQ
   790  004054  001401                          BEQ     77$             ;IF NO.ERROR SKIP HLT
   791  004056  104000                          HLT                     ;CALL ERROR ROUTINE
   792  004060                          77$:
   793
   794  004060  104400                          SCOPE
   795  004062  012777  125252  174156          MOV     #125252,@MQ             ;SET MQ=125252
   796  004070  012777  177771  174162          MOV     #177771,@LSH            ;SHIFT 177771 TIMES
   797  004076  105777  174152                  TSTB    @SR                     ;CHECK STATUS - NO CARRY
   798  004102  001401                          BEQ     78$             ;IF NO.ERROR SKIP HLT
   799  004104  104000                          HLT                     ;CALL ERROR ROUTINE
   800  004106                          78$:
   801  004106  022777  177525  174132          CMP     #177525,@MQ             ;COMPARE MQ
```

```
  802  004114  001401                          BEQ     79$             ;IF NO.ERROR SKIP HLT
  803  004116  104000                          HLT                     ;CALL ERROR ROUTINE
  804  004120                          79$:
  805  004120  104400                          SCOPE
  806  004122  012777  125252  174116          MOV     #125252,@MQ             ;SET MQ=125252
  807  004130  012777  177770  174122          MOV     #177770,@LSH            ;SHIFT 177770 TIMES
  808  004136  122777  000001  174110          CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
  809  004144  001401                          BEQ     80$             ;IF NO.ERROR SKIP HLT
  810  004146  104000                          HLT                     ;CALL ERROR ROUTINE
  811  004150                          80$:
  812  004150  022777  177652  174070          CMP     #177652,@MQ             ;COMPARE MQ
  813  004156  001401                          BEQ     81$             ;IF NO.ERROR SKIP HLT
  814  004160  104000                          HLT                     ;CALL ERROR ROUTINE
  815  004162                          81$:
  816
  817  004162  104400                          SCOPE
  818  004164  012777  125252  174054          MOV     #125252,@MQ             ;SET MQ=125252
  819  004172  012777  177767  174060          MOV     #177767,@LSH            ;SHIFT 177767 TIMES
  820  004200  105777  174050                  TSTB    @SR                     ;CHECK STATUS - NO CARRY
  821  004204  001401                          BEQ     82$             ;IF NO.ERROR SKIP HLT
  822  004206  104000                          HLT                     ;CALL ERROR ROUTINE
  823  004210                          82$:
  824  004210  022777  177725  174030          CMP     #177725,@MQ             ;COMPARE MQ
  825  004216  001401                          BEQ     83$             ;IF NO.ERROR SKIP HLT
  826  004220  104000                          HLT                     ;CALL ERROR ROUTINE
  827  004222                          83$:
  828
  829  004222  104400                          SCOPE
  830  004224  012777  125252  174014          MOV     #125252,@MQ             ;SET MQ=125252
  831  004232  012777  177766  174020          MOV     #177766,@LSH            ;SHIFT 177766 TIMES
  832  004240  122777  000001  174006          CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
  833  004246  001401                          BEQ     84$             ;IF NO.ERROR SKIP HLT
  834  004250  104000                          HLT                     ;CALL ERROR ROUTINE
  835  004252                          84$:
  836  004252  022777  177752  173766          CMP     #177752,@MQ             ;COMPARE MQ
  837  004260  001401                          BEQ     85$             ;IF NO.ERROR SKIP HLT
  838  004262  104000                          HLT                     ;CALL ERROR ROUTINE
  839  004264                          85$:
  840
  841  004264  104400                          SCOPE
  842  004266  012777  125252  173752          MOV     #125252,@MQ             ;SET MQ=125252
  843  004274  012777  177765  173756          MOV     #177765,@LSH            ;SHIFT 177765 TIMES
  844  004302  105777  173746                  TSTB    @SR                     ;CHECK STATUS - NO CARRY
  845  004306  001401                          BEQ     86$             ;IF NO.ERROR SKIP HLT
  846  004310  104000                          HLT                     ;CALL ERROR ROUTINE
  847  004312                          86$:
  848  004312  022777  177765  173726          CMP     #177765,@MQ             ;COMPARE MQ
```

```
                                        BEQ     87$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                87$:
                                        SCOPE
004324  104400
004326  012777  125252  173712            MOV     #125252,@MQ             ;SET MQ=125252
004334  012777  177764  173716            MOV     #177764,@LSH            ;SHIFT 177764 TIMES
004342  122777  000001  173704            CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
004350  001401                            BEQ     88$             ;IF NO.ERROR SKIP HLT
004352  104000                            HLT                     ;CALL ERROR ROUTINE
004354                          88$:
004354  022777  177772  173664            CMP     #177772,@MQ             ;COMPARE MQ
004362  001401                            BEQ     89$             ;IF NO.ERROR SKIP HLT
004364  104000                            HLT                     ;CALL ERROR ROUTINE
004366                          89$:

004366  104400                            SCOPE
004370  012777  125252  173650            MOV     #125252,@MQ             ;SET MQ=125252
004376  012777  177763  173654            MOV     #177763,@LSH            ;SHIFT 177763 TIMES
004404  105777  173644                    TSTB    @SR                     ;CHECK STATUS - NO CARRY
004410  001401                            BEQ     90$             ;IF NO.ERROR SKIP HLT
004412  104000                            HLT                     ;CALL ERROR ROUTINE
004414                          90$:
004414  022777  177775  173624            CMP     #177775,@MQ             ;COMPARE MQ
004422  001401                            BEQ     91$             ;IF NO.ERROR SKIP HLT
004424  104000                            HLT                     ;CALL ERROR ROUTINE
004426                          91$:

004426  104400                            SCOPE
004430  012777  125252  173610            MOV     #125252,@MQ             ;SET MQ=125252
004436  012777  177762  173614            MOV     #177762,@LSH            ;SHIFT 177762 TIMES
004444  122777  000001  173602            CMPB    #1,@SR                  ;CHECK STATUS - WITH CARRY
004452  001401                            BEQ     92$             ;IF NO.ERROR SKIP HLT
004454  104000                            HLT                     ;CALL ERROR ROUTINE
004456                          92$:
004456  022777  177776  173562            CMP     #177776,@MQ             ;COMPARE MQ
004464  001401                            BEQ     93$             ;IF NO.ERROR SKIP HLT
004466  104000                            HLT                     ;CALL ERROR ROUTINE
004470                          93$:

004470  104400                            SCOPE
004472  012777  125252  173546            MOV     #125252,@MQ             ;SET MQ=125252
004500  012777  177761  173552            MOV     #177761,@LSH            ;SHIFT 177761 TIMES
004506  105777  173542                    TSTB    @SR                     ;CHECK STATUS - NO CARRY
004512  001401                            BEQ     94$             ;IF NO.ERROR SKIP HLT
004514  104000                            HLT                     ;CALL ERROR ROUTINE
004516                          94$:
004516  022777  177777  173522            CMP     #177777,@MQ             ;COMPARE MQ
004524  001401                            BEQ     95$             ;IF NO.ERROR SKIP HLT
004526  104000                            HLT                     ;CALL ERROR ROUTINE
004530                          95$:
```

```
                                ;;*****************************************************************
                                ;       TEST AC SHIFT LEFT OF ALTERNATE 1'S AND 0'S
                                ;;*****************************************************************
004530                          AC10L:
                                        SCOPE
004530  104400
004532  005077  173510                  CLR     @MQ
004536  012777  125252  173500          MOV     #125252,@AC             ;SET AC=125252
004544  005077  173510                  CLR     @LSH                    ;INITALIZE SHIFT BY 0
004550  027727  173470  125252          CMP     @AC,#125252             ;COMPARE AC
004556  001401                          BEQ     64$             ;IF NO.ERROR SKIP HLT
004560  104000                          HLT                     ;CALL ERROR ROUTINE
004562                          64$:
004562  122777  000310  173464          CMPB    #310,@SR                ;CHECK STATUS
004570  001401                          BEQ     65$             ;IF NO.ERROR SKIP HLT
004572  104000                          HLT                     ;CALL ERROR ROUTINE
004574                          65$:

004574  104400                          SCOPE
004576  012777  125252  173440          MOV     #125252,@AC             ;SET AC=125252
004604  012777  000001  173446          MOV     #1,@LSH                 ;SHIFT 1 TIMES
004612  122777  000211  173434          CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
004620  001401                          BEQ     66$             ;IF NO.ERROR SKIP HLT
004622  104000                          HLT                     ;CALL ERROR ROUTINE
004624                          66$:
004624  022777  052524  173412          CMP     #52524,@AC              ;COMPARE AC
004632  001401                          BEQ     67$             ;IF NO.ERROR SKIP HLT
004634  104000                          HLT                     ;CALL ERROR ROUTINE
004636                          67$:


004636  104400                          SCOPE
004640  012777  125252  173376          MOV     #125252,@AC             ;SET AC=125252
004646  012777  000002  173404          MOV     #2,@LSH                 ;SHIFT 2 TIMES
004654  122777  000110  173372          CMPB    #110,@SR                ;CHECK STATUS - NO CARRY
004662  001401                          BEQ     68$             ;IF NO.ERROR SKIP HLT
004664  104000                          HLT                     ;CALL ERROR ROUTINE
004666                          68$:
004666  022777  125250  173350          CMP     #125250,@AC             ;COMPARE AC
004674  001401                          BEQ     69$             ;IF NO.ERROR SKIP HLT
004676  104000                          HLT                     ;CALL ERROR ROUTINE
004700                          69$:


004700  104400                          SCOPE
004702  012777  125252  173334          MOV     #125252,@AC             ;SET AC=125252
004710  012777  000003  173342          MOV     #3,@LSH                 ;SHIFT 3 TIMES
004716  122777  000211  173330          CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
004724  001401                          BEQ     70$             ;IF NO.ERROR SKIP HLT
004726  104000                          HLT                     ;CALL ERROR ROUTINE
004730                          70$:
004730  022777  052520  173306          CMP     #52520,@AC              ;COMPARE AC
```

```
                                        BEQ     71$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                71$:
                                        SCOPE
                                        MOV     #125252,@AC             ;SET AC=125252
                                        MOV     #4,@LSH                 ;SHIFT 4 TIMES
                                        CMPB    #11G,@SR                ;CHECK STATUS - NO CARRY
                                        BEQ     72$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                72$:
                                        CMP     #125240,@AC             ;COMPARE AC
                                        BEQ     73$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                73$:


                                        SCOPE
                                        MOV     #125252,@AC             ;SET AC=125252
                                        MOV     #5,@LSH                 ;SHIFT 5 TIMES
                                        CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
                                        BEQ     74$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                74$:
                                        CMP     #52500,@AC              ;COMPARE AC
                                        BEQ     75$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                75$:


                                        SCOPE
                                        MOV     #125252,@AC             ;SET AC=125252
                                        MOV     #6,@LSH                 ;SHIFT 6 TIMES
                                        CMPB    #110,@SR                ;CHECK STATUS - NO CARRY
                                        BEQ     76$             ;IF NO.ERROR SKIP HLT
                                        HLT                     ;CALL ERROR ROUTINE
                                76$:
                                        CMP     #125200,@AC             ;COMPARE AC
```

```
  987  005104  001401                        BEQ     77$             ;IF NO.ERROR SKIP HLT
  988  005106  104000                        HLT                     ;CALL ERROR ROUTINE
  989  005110                          77$:
  990
  991
  992  005110  104400                        SCOPE
  993  005112  012777  125252  173124        MOV     #125252,@AC             ;SET AC=125252
  994  005120  012777  000007  173132        MOV     #7,@LSH                 ;SHIFT 7 TIMES
  995  005126  122777  000211  173120        CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
  996  005134  001401                        BEQ     78$             ;IF NO.ERROR SKIP HLT
  997  005136  104000                        HLT                     ;CALL ERROR ROUTINE
  998  005140                          78$:
  999  005140  022777  052400  173076        CMP     #52400,@AC              ;COMPARE AC
 1000  005146  001401                        BEQ     79$             ;IF NO.ERROR SKIP HLT
 1001  005150  104000                        HLT                     ;CALL ERROR ROUTINE
 1002  005152                          79$:
 1003
 1004  005152  104400                        SCOPE
 1005  005154  012777  125252  173062        MOV     #125252,@AC             ;SET AC=125252
 1006  005162  012777  000010  173070        MOV     #10,@LSH                ;SHIFT 10 TIMES
 1007  005170  122777  000110  173056        CMPB    #110,@SR                ;CHECK STATUS - NO CARRY
 1008  005176  001401                        BEQ     80$             ;IF NO.ERROR SKIP HLT
 1009  005200  104000                        HLT                     ;CALL ERROR ROUTINE
 1010  005202                          80$:
 1011  005202  022777  125000  173034        CMP     #125000,@AC             ;COMPARE AC
 1012  005210  001401                        BEQ     81$             ;IF NO.ERROR SKIP HLT
 1013  005212  104000                        HLT                     ;CALL ERROR ROUTINE
 1014  005214                          81$:
 1015
 1016  005214  104400                        SCOPE
 1017  005216  012777  125252  173020        MOV     #125252,@AC             ;SET AC=125252
 1018  005224  012777  000011  173026        MOV     #11,@LSH                ;SHIFT 11 TIMES
 1019  005232  122777  000211  173014        CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
 1020  005240  001401                        BEQ     82$             ;IF NO.ERROR SKIP HLT
 1021  005242  104000                        HLT                     ;CALL ERROR ROUTINE
 1022  005244                          82$:
 1023  005244  022777  052000  172772        CMP     #52000,@AC              ;COMPARE AC
 1024  005252  001401                        BEQ     83$             ;IF NO.ERROR SKIP HLT
 1025  005254  104000                        HLT                     ;CALL ERROR ROUTINE
 1026  005256                          83$:
 1027
 1028
 1029  005256  104400                        SCOPE
 1030  005260  012777  125252  172756        MOV     #125252,@AC             ;SET AC=125252
 1031  005266  012777  000012  172764        MOV     #12,@LSH                ;SHIFT 12 TIMES
 1032  005274  122777  000110  172752        CMPB    #110,@SR                ;CHECK STATUS - NO CARRY
 1033  005302  001401                        BEQ     84$             ;IF NO.ERROR SKIP HLT
 1034  005304  104000                        HLT                     ;CALL ERROR ROUTINE
 1035  005306                          84$:
 1036  005306  022777  124000  172730        CMP     #124000,@AC             ;COMPARE AC
```

```
1037  005314  001401                        BEQ     85$             ;IF NO.ERROR SKIP HLT
1038  005316  104000                        HLT                     ;CALL ERROR ROUTINE
1039  005320                          85$:
1040
1041
1042  005320  104400                        SCOPE
1043  005322  012777  125252  172714        MOV     #125252,@AC             ;SET AC=125252
1044  005330  012777  000013  172722        MOV     #13,@LSH                ;SHIFT 13 TIMES
1045  005336  122777  000211  172710        CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
1046  005344  001401                        BEQ     86$             ;IF NO.ERROR SKIP HLT
1047  005346  104000                        HLT                     ;CALL ERROR ROUTINE
1048  005350                          86$:
1049  005350  022777  050000  172666        CMP     #50000,@AC              ;COMPARE AC
1050  005356  001401                        BEQ     87$             ;IF NO.ERROR SKIP HLT
1051  005360  104000                        HLT                     ;CALL ERROR ROUTINE
1052  005362                          87$:
1053
1054  005362  104400                        SCOPE
1055  005364  012777  125252  172652        MOV     #125252,@AC             ;SET AC=125252
1056  005372  012777  000014  172660        MOV     #14,@LSH                ;SHIFT 14 TIMES
1057  005400  122777  000110  172646        CMPB    #110,@SR                ;CHECK STATUS - NO CARRY
1058  005406  001401                        BEQ     88$             ;IF NO.ERROR SKIP HLT
1059  005410  104000                        HLT                     ;CALL ERROR ROUTINE
1060  005412                          88$:
1061  005412  022777  120000  172624        CMP     #120000,@AC             ;COMPARE AC
1062  005420  001401                        BEQ     89$             ;IF NO.ERROR SKIP HLT
1063  005422  104000                        HLT                     ;CALL ERROR ROUTINE
1064  005424                          89$:
1065
1066
1067  005424  104400                        SCOPE
1068  005426  012777  125252  172610        MOV     #125252,@AC             ;SET AC=125252
1069  005434  012777  000015  172616        MOV     #15,@LSH                ;SHIFT 15 TIMES
1070  005442  122777  000211  172604        CMPB    #211,@SR                ;CHECK STATUS - WITH CARRY
1071  005450  001401                        BEQ     90$             ;IF NO.ERROR SKIP HLT
1072  005452  104000                        HLT                     ;CALL ERROR ROUTINE
1073  005454                          90$:
1074  005454  022777  040000  172562        CMP     #40000,@AC              ;COMPARE AC
1075  005462  001401                        BEQ     91$             ;IF NO.ERROR SKIP HLT
1076  005464  104000                        HLT                     ;CALL ERROR ROUTINE
1077  005466                          91$:
1078
1079  005466  104400                        SCOPE
1080  005470  012777  125252  172546        MOV     #125252,@AC             ;SET AC=125252
1081  005476  012777  000016  172554        MOV     #16,@LSH                ;SHIFT 16 TIMES
1082  005504  122777  000110  172542        CMPB    #110,@SR                ;CHECK STATUS - NO CARRY
1083  005512  001401                        BEQ     92$             ;IF NO.ERROR SKIP HLT
1084  005514  104000                        HLT                     ;CALL ERROR ROUTINE
1085  005516                          92$:
1086  005516  022777  100000  172520        CMP     #100000,@AC             ;COMPARE AC
1087  005524  001401                        BEQ     93$             ;IF NO.ERROR SKIP HLT
1088  005526  104000                        HLT                     ;CALL ERROR ROUTINE
1089  005530                          93$:
```

```
1090                                    ;;*****************************************************************
1091                                    ;       TEST OF MQ SHIFT INTO AC
1092                                    ;*****************************************************************
1093   005530                           MQAC:
1094
1095   005530  104400                           SCOPE                           ;TEST OF LOGICAL SHIFT
1096   005532  012777  000000  172506           MOV     #0,@MQ                  ;LOAD MQ WITH 0
1097   005540  012777  000000  172476           MOV     #0,@AC                  ;LOAD AC WITH 0
1098   005546  012777  000020  172504           MOV     #16.,@LSH               ;LOAD SHIFT COUNT (LSH) WITH 16.
1099   005554  022777  000000  172462           CMP     #0,@AC                  ;COMPARE AC WITH 0
1100   005562  001401                           BEQ     64$             ;IF NO.ERROR SKIP HLT
1101   005564  104000                           HLT                     ;CALL ERROR ROUTINE
1102   005566                           64$:
1103   005566  022777  000000  172452           CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1104   005574  001401                           BEQ     65$             ;IF NO.ERROR SKIP HLT
1105   005576  104000                           HLT                     ;CALL ERROR ROUTINE
1106   005600                           65$:
1107   005600  122777  000036  172446           CMPB    #36,@SR                 ;COMPARE SR WITH 36
1108   005606  001401                           BEQ     66$             ;IF NO.ERROR SKIP HLT
1109   005610  104000                           HLT                     ;CALL ERROR ROUTINE
1110   005612                           66$:
1111
1112
1113
1114   005612  104400                           SCOPE                           ;TEST OF LOGICAL SHIFT
1115   005614  012777  177777  172424           MOV     #-1,@MQ                 ;LOAD MQ WITH -1
1116   005622  012777  000000  172414           MOV     #0,@AC                  ;LOAD AC WITH 0
1117   005630  012777  000020  172422           MOV     #16.,@LSH               ;LOAD SHIFT COUNT (LSH) WITH 16.
1118   005636  022777  177777  172400           CMP     #-1,@AC                 ;COMPARE AC WITH -1
1119   005644  001401                           BEQ     67$             ;IF NO.ERROR SKIP HLT
1120   005646  104000                           HLT                     ;CALL ERROR ROUTINE
1121   005650                           67$:
1122   005650  022777  000000  172370           CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1123   005656  001401                           BEQ     68$             ;IF NO.ERROR SKIP HLT
1124   005660  104000                           HLT                     ;CALL ERROR ROUTINE
1125   005662                           68$:
1126   005662  122777  000150  172364           CMPB    #150,@SR                ;COMPARE SR WITH 150
1127   005670  001401                           BEQ     69$             ;IF NO.ERROR SKIP HLT
1128   005672  104000                           HLT                     ;CALL ERROR ROUTINE
1129   005674                           69$:
1130
1131   005674  104400                           SCOPE                           ;TEST OF LOGICAL SHIFT
1132   005676  012777  177777  172342           MOV     #-1,@MQ                 ;LOAD MQ WITH -1
1133   005704  012777  000000  172332           MOV     #0,@AC                  ;LOAD AC WITH 0
1134   005712  012777  000037  172340           MOV     #31.,@LSH               ;LOAD SHIFT COUNT (LSH) WITH 31.
1135   005720  022777  100000  172316           CMP     #100000,@AC             ;COMPARE AC WITH 100000
1136   005726  001401                           BEQ     70$             ;IF NO.ERROR SKIP HLT
1137   005730  104000                           HLT                     ;CALL ERROR ROUTINE
1138   005732                           70$:
1139   005732  022777  000000  172306           CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1140   005740  001401                           BEQ     71$             ;IF NO.ERROR SKIP HLT
1141   005742  104000                           HLT                     ;CALL ERROR ROUTINE
1142   005744                           71$:
1143   005744  122777  000111  172302           CMPB    #111,@SR                ;COMPARE SR WITH 111
1144   005752  001401                           BEQ     72$             ;IF NO.ERROR SKIP HLT
1145   005754  104000                           HLT                     ;CALL ERROR ROUTINE
```

```
1146  005756                                  72$:
1147  005756  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1148  005760  012777  125252  172260          MOV     #125252,@MQ     ;LOAD MQ WITH 125252
1149  005766  012777  000000  172250          MOV     #0,@AC          ;LOAD AC WITH 0
1150  005774  012777  000020  172256          MOV     #16.,@LSH       ;LOAD SHIFT COUNT (LSH) WITH 16.
1151  006002  022777  125252  172234          CMP     #125252,@AC     ;COMPARE AC WITH 125252
1152  006010  001401                          BEQ     73$             ;IF NO.ERROR SKIP HLT
1153  006012  104000                          HLT                     ;CALL ERROR ROUTINE
1154  006014                                  73$:
1155  006014  022777  000000  172224          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1156  006022  001401                          BEQ     74$             ;IF NO.ERROR SKIP HLT
1157  006024  104000                          HLT                     ;CALL ERROR ROUTINE
1158  006026                                  74$:
1159  006026  122777  000110  172220          CMPB    #110,@SR        ;COMPARE SR WITH 110
1160  006034  001401                          BEQ     75$             ;IF NO.ERROR SKIP HLT
1161  006036  104000                          HLT                     ;CALL ERROR ROUTINE
1162  006040                                  75$:
1163
1164
1165
1166  006040  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1167  006042  012777  125252  172176          MOV     #125252,@MQ     ;LOAD MQ WITH 125252
1168  006050  012777  000000  172166          MOV     #0,@AC          ;LOAD AC WITH 0
1169  006056  012777  000001  172174          MOV     #1,@LSH         ;LOAD SHIFT COUNT (LSH) WITH 1
1170  006064  022777  000001  172152          CMP     #1,@AC          ;COMPARE AC WITH 1
1171  006072  001401                          BEQ     76$             ;IF NO.ERROR SKIP HLT
1172  006074  104000                          HLT                     ;CALL ERROR ROUTINE
1173  006076                                  76$:
1174  006076  022777  052524  172142          CMP     #52524,@MQ      ;COMPARE MQ WITH 52524
1175  006104  001401                          BEQ     77$             ;IF NO.ERROR SKIP HLT
1176  006106  104000                          HLT                     ;CALL ERROR ROUTINE
1177  006110                                  77$:
1178  006110  122777  000000  172136          CMPB    #0,@SR          ;COMPARE SR WITH 0
1179  006116  001401                          BEQ     78$             ;IF NO.ERROR SKIP HLT
1180  006120  104000                          HLT                     ;CALL ERROR ROUTINE
1181  006122                                  78$:
1182
1183
1184  006122  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1185  006124  012777  000001  172114          MOV     #1,@MQ          ;LOAD MQ WITH 1
1186  006132  012777  000000  172104          MOV     #0,@AC          ;LOAD AC WITH 0
1187  006140  012777  000021  172112          MOV     #21,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 21
1188  006146  022777  000002  172070          CMP     #2,@AC          ;COMPARE AC WITH 2
1189  006154  001401                          BEQ     79$             ;IF NO.ERROR SKIP HLT
1190  006156  104000                          HLT                     ;CALL ERROR ROUTINE
1191  006160                                  79$:
1192  006160  022777  000000  172060          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1193  006166  001401                          BEQ     80$             ;IF NO.ERROR SKIP HLT
1194  006170  104000                          HLT                     ;CALL ERROR ROUTINE
1195  006172                                  80$:
1196  006172  122777  000010  172054          CMPB    #10,@SR         ;COMPARE SR WITH 10
1197  006200  001401                          BEQ     81$             ;IF NO.ERROR SKIP HLT
1198  006202  104000                          HLT                     ;CALL ERROR ROUTINE
1199  006204                                  81$:
1200
1201  006204  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
```

```
1202  006206  012777  000001  172032          MOV     #1,@MQ                  ;LOAD MQ WITH 1
1203  006214  012777  000000  172022          MOV     #0,@AC                  ;LOAD AC WITH 0
1204  006222  012777  000022  172030          MOV     #22,@LSH                ;LOAD SHIFT COUNT (LSH) WITH 22
1205  006230  022777  000004  172006          CMP     #4,@AC                  ;COMPARE AC WITH 4
1206  006236  001401                          BEQ     82$             ;IF NO.ERROR SKIP HLT
1207  006240  104000                          HLT                     ;CALL ERROR ROUTINE
1208  006242                          82$:
1209  006242  022777  000000  171776          CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1210  006250  001401                          BEQ     83$             ;IF NO.ERROR SKIP HLT
1211  006252  104000                          HLT                     ;CALL ERROR ROUTINE
1212  006254                          83$:
1213  006254  122777  000010  171772          CMPB    #10,@SR                 ;COMPARE SR WITH 10
1214  006262  001401                          BEQ     84$             ;IF NO.ERROR SKIP HLT
1215  006264  104000                          HLT                     ;CALL ERROR ROUTINE
1216  006266                          84$:
1217
1218
1219  006266  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1220  006270  012777  000001  171750          MOV     #1,@MQ                  ;LOAD MQ WITH 1
1221  006276  012777  000000  171740          MOV     #0,@AC                  ;LOAD AC WITH 0
1222  006304  012777  000023  171746          MOV     #23,@LSH                ;LOAD SHIFT COUNT (LSH) WITH 23
1223  006312  022777  000010  171724          CMP     #10,@AC                 ;COMPARE AC WITH 10
1224  006320  001401                          BEQ     85$             ;IF NO.ERROR SKIP HLT
1225  006322  104000                          HLT                     ;CALL ERROR ROUTINE
1226  006324                          85$:
1227  006324  022777  000000  171714          CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1228  006332  001401                          BEQ     86$             ;IF NO.ERROR SKIP HLT
1229  006334  104000                          HLT                     ;CALL ERROR ROUTINE
1230  006336                          86$:
1231  006336  122777  000010  171710          CMPB    #10,@SR                 ;COMPARE SR WITH 10
1232  006344  001401                          BEQ     87$             ;IF NO.ERROR SKIP HLT
1233  006346  104000                          HLT                     ;CALL ERROR ROUTINE
1234  006350                          87$:
1235
1236
1237  006350  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1238  006352  012777  000001  171666          MOV     #1,@MQ                  ;LOAD MQ WITH 1
1239  006360  012777  000000  171656          MOV     #0,@AC                  ;LOAD AC WITH 0
1240  006366  012777  000024  171664          MOV     #24,@LSH                ;LOAD SHIFT COUNT (LSH) WITH 24
1241  006374  022777  000020  171642          CMP     #20,@AC                 ;COMPARE AC WITH 20
1242  006402  001401                          BEQ     88$             ;IF NO.ERROR SKIP HLT
1243  006404  104000                          HLT                     ;CALL ERROR ROUTINE
1244  006406                          88$:
1245  006406  022777  000000  171632          CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1246  006414  001401                          BEQ     89$             ;IF NO.ERROR SKIP HLT
1247  006416  104000                          HLT                     ;CALL ERROR ROUTINE
1248  006420                          89$:
1249  006420  122777  000010  171626          CMPB    #10,@SR                 ;COMPARE SR WITH 10
1250  006426  001401                          BEQ     90$             ;IF NO.ERROR SKIP HLT
1251  006430  104000                          HLT                     ;CALL ERROR ROUTINE
1252  006432                          90$:
1253
1254  006432  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1255  006434  012777  000001  171604          MOV     #1,@MQ                  ;LOAD MQ WITH 1
1256  006442  012777  000000  171574          MOV     #0,@AC                  ;LOAD AC WITH 0
1257  006450  012777  000025  171602          MOV     #25,@LSH                ;LOAD SHIFT COUNT (LSH) WITH 25
```

```
1258  006456  022777  000040  171560          CMP     #40,@AC         ;COMPARE AC WITH 40
1259  006464  001401                          BEQ     91$             ;IF NO.ERROR SKIP HLT
1260  006466  104000                          HLT                     ;CALL ERROR ROUTINE
1261  006470                          91$:
1262  006470  022777  000000  171550          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1263  006476  001401                          BEQ     92$             ;IF NO.ERROR SKIP HLT
1264  006500  104000                          HLT                     ;CALL ERROR ROUTINE
1265  006502                          92$:
1266  006502  122777  000010  171544          CMPB    #10,@SR         ;COMPARE SR WITH 10
1267  006510  001401                          BEQ     93$             ;IF NO.ERROR SKIP HLT
1268  006512  104000                          HLT                     ;CALL ERROR ROUTINE
1269  006514                          93$:
1270
1271
1272
1273  006514  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1274  006516  012777  000001  171522          MOV     #1,@MQ          ;LOAD MQ WITH 1
1275  006524  012777  000000  171512          MOV     #0,@AC          ;LOAD AC WITH 0
1276  006532  012777  000026  171520          MOV     #26,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 26
1277  006540  022777  000100  171476          CMP     #100,@AC        ;COMPARE AC WITH 100
1278  006546  001401                          BEQ     94$             ;IF NO.ERROR SKIP HLT
1279  006550  104000                          HLT                     ;CALL ERROR ROUTINE
1280  006552                          94$:
1281  006552  022777  000000  171466          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1282  006560  001401                          BEQ     95$             ;IF NO.ERROR SKIP HLT
1283  006562  104000                          HLT                     ;CALL ERROR ROUTINE
1284  006564                          95$:
1285  006564  122777  000010  171462          CMPB    #10,@SR         ;COMPARE SR WITH 10
1286  006572  001401                          BEQ     96$             ;IF NO.ERROR SKIP HLT
1287  006574  104000                          HLT                     ;CALL ERROR ROUTINE
1288  006576                          96$:
1289
1290
1291  006576  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1292  006600  012777  000001  171440          MOV     #1,@MQ          ;LOAD MQ WITH 1
1293  006606  012777  000000  171430          MOV     #0,@AC          ;LOAD AC WITH 0
1294  006614  012777  000027  171436          MOV     #27,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 27
1295  006622  022777  000200  171414          CMP     #200,@AC        ;COMPARE AC WITH 200
1296  006630  001401                          BEQ     97$             ;IF NO.ERROR SKIP HLT
1297  006632  104000                          HLT                     ;CALL ERROR ROUTINE
1298  006634                          97$:
1299  006634  022777  000000  171404          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1300  006642  001401                          BEQ     98$             ;IF NO.ERROR SKIP HLT
1301  006644  104000                          HLT                     ;CALL ERROR ROUTINE
1302  006646                          98$:
1303  006646  122777  000010  171400          CMPB    #10,@SR         ;COMPARE SR WITH 10
1304  006654  001401                          BEQ     99$             ;IF NO.ERROR SKIP HLT
1305  006656  104000                          HLT                     ;CALL ERROR ROUTINE
1306  006660                          99$:
1307  006660  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1308  006662  012777  000001  171356          MOV     #1,@MQ          ;LOAD MQ WITH 1
1309  006670  012777  000000  171346          MOV     #0,@AC          ;LOAD AC WITH 0
1310  006676  012777  000030  171354          MOV     #30,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 30
1311  006704  022777  000400  171332          CMP     #400,@AC        ;COMPARE AC WITH 400
1312  006712  001401                          BEQ     100$            ;IF NO.ERROR SKIP HLT
1313  006714  104000                          HLT                     ;CALL ERROR ROUTINE
```

```
1314  006716                          100$:
1315  006716  022777  000000  171322          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1316  006724  001401                          BEQ     101$            ;IF NO.ERROR SKIP HLT
1317  006726  104000                          HLT                     ;CALL ERROR ROUTINE
1318  006730                          101$:
1319  006730  122777  000010  171316          CMPB    #10,@SR         ;COMPARE SR WITH 10
1320  006736  001401                          BEQ     102$            ;IF NO.ERROR SKIP HLT
1321  006740  104000                          HLT                     ;CALL ERROR ROUTINE
1322  006742                          102$:
1323  006742  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1324  006744  012777  000001  171274          MOV     #1,@MQ          ;LOAD MQ WITH 1
1325  006752  012777  000000  171264          MOV     #0,@AC          ;LOAD AC WITH 0
1326  006760  012777  000031  171272          MOV     #31,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 31
1327  006766  022777  001000  171250          CMP     #1000,@AC       ;COMPARE AC WITH 1000
1328  006774  001401                          BEQ     103$            ;IF NO.ERROR SKIP HLT
1329  006776  104000                          HLT                     ;CALL ERROR ROUTINE
1330  007000                          103$:
1331  007000  022777  000000  171240          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1332  007006  001401                          BEQ     104$            ;IF NO.ERROR SKIP HLT
1333  007010  104000                          HLT                     ;CALL ERROR ROUTINE
1334  007012                          104$:
1335  007012  122777  000010  171234          CMPB    #10,@SR         ;COMPARE SR WITH 10
1336  007020  001401                          BEQ     105$            ;IF NO.ERROR SKIP HLT
1337  007022  104000                          HLT                     ;CALL ERROR ROUTINE
1338  007024                          105$:
1339  007024  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1340  007026  012777  000001  171212          MOV     #1,@MQ          ;LOAD MQ WITH 1
1341  007034  012777  000000  171202          MOV     #0,@AC          ;LOAD AC WITH 0
1342  007042  012777  000032  171210          MOV     #32,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 32
1343  007050  022777  002000  171166          CMP     #2000,@AC       ;COMPARE AC WITH 2000
1344  007056  001401                          BEQ     106$            ;IF NO.ERROR SKIP HLT
1345  007060  104000                          HLT                     ;CALL ERROR ROUTINE
1346  007062                          106$:
1347  007062  022777  000000  171156          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1348  007070  001401                          BEQ     107$            ;IF NO.ERROR SKIP HLT
1349  007072  104000                          HLT                     ;CALL ERROR ROUTINE
1350  007074                          107$:
1351  007074  122777  000010  171152          CMPB    #10,@SR         ;COMPARE SR WITH 10
1352  007102  001401                          BEQ     108$            ;IF NO.ERROR SKIP HLT
1353  007104  104000                          HLT                     ;CALL ERROR ROUTINE
1354  007106                          108$:
1355  007106  104400                          SCOPE                   ;TEST OF LOGICAL SHIFT
1356  007110  012777  000001  171130          MOV     #1,@MQ          ;LOAD MQ WITH 1
1357  007116  012777  000000  171120          MOV     #0,@AC          ;LOAD AC WITH 0
1358  007124  012777  000033  171126          MOV     #33,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 33
1359  007132  022777  004000  171104          CMP     #4000,@AC       ;COMPARE AC WITH 4000
1360  007140  001401                          BEQ     109$            ;IF NO.ERROR SKIP HLT
1361  007142  104000                          HLT                     ;CALL ERROR ROUTINE
1362  007144                          109$:
1363  007144  022777  000000  171074          CMP     #0,@MQ          ;COMPARE MQ WITH 0
1364  007152  001401                          BEQ     110$            ;IF NO.ERROR SKIP HLT
1365  007154  104000                          HLT                     ;CALL ERROR ROUTINE
1366  007156                          110$:
1367  007156  122777  000010  171070          CMPB    #10,@SR         ;COMPARE SR WITH 10
1368  007164  001401                          BEQ     111$            ;IF NO.ERROR SKIP HLT
1369  007166  104000                          HLT                     ;CALL ERROR ROUTINE
```

```
 1370  007170                          111$:
 1371
 1372
 1373  007170  104400                        SCOPE                   ;TEST OF LOGICAL SHIFT
 1374  007172  012777  000001  171046        MOV     #1,@MQ          ;LOAD MQ WITH 1
 1375  007200  012777  000000  171036        MOV     #0,@AC          ;LOAD AC WITH 0
 1376  007206  012777  000034  171044        MOV     #34,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 34
 1377  007214  022777  010000  171022        CMP     #10000,@AC      ;COMPARE AC WITH 10000
 1378  007222  001401                        BEQ     112$    ;IF NO.ERROR SKIP HLT
 1379  007224  104000                        HLT             ;CALL ERROR ROUTINE
 1380  007226                          112$:
 1381  007226  022777  000000  171012        CMP     #0,@MQ          ;COMPARE MQ WITH 0
 1382  007234  001401                        BEQ     113$    ;IF NO.ERROR SKIP HLT
 1383  007236  104000                        HLT             ;CALL ERROR ROUTINE
 1384  007240                          113$:
 1385  007240  122777  000010  171006        CMPB    #10,@SR         ;COMPARE SR WITH 10
 1386  007246  001401                        BEQ     114$    ;IF NO.ERROR SKIP HLT
 1387  007250  104000                        HLT             ;CALL ERROR ROUTINE
 1388  007252                          114$:
 1389
 1390
 1391  007252  104400                        SCOPE                   ;TEST OF LOGICAL SHIFT
 1392  007254  012777  000001  170764        MOV     #1,@MQ          ;LOAD MQ WITH 1
 1393  007262  012777  000000  170754        MOV     #0,@AC          ;LOAD AC WITH 0
 1394  007270  012777  000035  170762        MOV     #35,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 35
 1395  007276  022777  020000  170740        CMP     #20000,@AC      ;COMPARE AC WITH 20000
 1396  007304  001401                        BEQ     115$    ;IF NO.ERROR SKIP HLT
 1397  007306  104000                        HLT             ;CALL ERROR ROUTINE
 1398  007310                          115$:
 1399  007310  022777  000000  170730        CMP     #0,@MQ          ;COMPARE MQ WITH 0
 1400  007316  001401                        BEQ     116$    ;IF NO.ERROR SKIP HLT
 1401  007320  104000                        HLT             ;CALL ERROR ROUTINE
 1402  007322                          116$:
 1403  007322  122777  000010  170724        CMPB    #10,@SR         ;COMPARE SR WITH 10
 1404  007330  001401                        BEQ     117$    ;IF NO.ERROR SKIP HLT
 1405  007332  104000                        HLT             ;CALL ERROR ROUTINE
 1406  007334                          117$:
 1407  007334  104400                        SCOPE                   ;TEST OF LOGICAL SHIFT
 1408  007336  012777  000001  170702        MOV     #1,@MQ          ;LOAD MQ WITH 1
 1409  007344  012777  000000  170672        MOV     #0,@AC          ;LOAD AC WITH 0
 1410  007352  012777  000036  170700        MOV     #36,@LSH        ;LOAD SHIFT COUNT (LSH) WITH 36
 1411  007360  022777  040000  170656        CMP     #40000,@AC      ;COMPARE AC WITH 40000
 1412  007366  001401                        BEQ     118$    ;IF NO.ERROR SKIP HLT
 1413  007370  104000                        HLT             ;CALL ERROR ROUTINE
 1414  007372                          118$:
 1415  007372  022777  000000  170646        CMP     #0,@MQ          ;COMPARE MQ WITH 0
 1416  007400  001401                        BEQ     119$    ;IF NO.ERROR SKIP HLT
 1417  007402  104000                        HLT             ;CALL ERROR ROUTINE
 1418  007404                          119$:
 1419  007404  122777  000010  170642        CMPB    #10,@SR         ;COMPARE SR WITH 10
 1420  007412  001401                        BEQ     120$    ;IF NO.ERROR SKIP HLT
 1421  007414  104000                        HLT             ;CALL ERROR ROUTINE
 1422  007416                          120$:
```

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1423                                    ;;*****************************************************************
1424                                    ;       TEST OF AC SHIFT INTO MQ
1425                                    ;*****************************************************************
1426  007416                            ACMQ:
1427
1428
1429  007416  104400                            SCOPE                           ;TEST OF LOGICAL SHIFT
1430  007420  012777  000000  170620            MOV     #0,@MQ                  ;LOAD MQ WITH 0
1431  007426  012777  000000  170610            MOV     #0,@AC                  ;LOAD AC WITH 0
1432  007434  012777  177760  170616            MOV     #-16.,@LSH              ;LOAD SHIFT COUNT (LSH) WITH -16.
1433  007442  022777  000000  170574            CMP     #0,@AC                  ;COMPARE AC WITH 0
1434  007450  001401                            BEQ     64$             ;IF NO.ERROR SKIP HLT
1435  007452  104000                            HLT                     ;CALL ERROR ROUTINE
1436  007454                            64$:
1437  007454  022777  000000  170564            CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1438  007462  001401                            BEQ     65$             ;IF NO.ERROR SKIP HLT
1439  007464  104000                            HLT                     ;CALL ERROR ROUTINE
1440  007466                            65$:
1441  007466  122777  000036  170560            CMPB    #36,@SR                 ;COMPARE SR WITH 36
1442  007474  001401                            BEQ     66$             ;IF NO.ERROR SKIP HLT
1443  007476  104000                            HLT                     ;CALL ERROR ROUTINE
1444  007500                            66$:
1445
1446
1447  007500  104400                            SCOPE                           ;TEST OF LOGICAL SHIFT
1448  007502  012777  000000  170536            MOV     #0,@MQ                  ;LOAD MQ WITH 0
1449  007510  012777  177777  170526            MOV     #-1,@AC                 ;LOAD AC WITH -1
1450  007516  012777  177760  170534            MOV     #-16.,@LSH              ;LOAD SHIFT COUNT (LSH) WITH -16.
1451  007524  022777  000000  170512            CMP     #0,@AC                  ;COMPARE AC WITH 0
1452  007532  001401                            BEQ     67$             ;IF NO.ERROR SKIP HLT
1453  007534  104000                            HLT                     ;CALL ERROR ROUTINE
1454  007536                            67$:
1455  007536  022777  177777  170502            CMP     #-1,@MQ                 ;COMPARE MQ WITH -1
1456  007544  001401                            BEQ     68$             ;IF NO.ERROR SKIP HLT
1457  007546  104000                            HLT                     ;CALL ERROR ROUTINE
1458  007550                            68$:
1459  007550  122777  000020  170476            CMPB    #20,@SR                 ;COMPARE SR WITH 20
1460  007556  001401                            BEQ     69$             ;IF NO.ERROR SKIP HLT
1461  007560  104000                            HLT                     ;CALL ERROR ROUTINE
1462  007562                            69$:
1463  007562  104400                            SCOPE                           ;TEST OF LOGICAL SHIFT
1464  007564  012777  000000  170454            MOV     #0,@MQ                  ;LOAD MQ WITH 0
1465  007572  012777  177777  170444            MOV     #-1,@AC                 ;LOAD AC WITH -1
1466  007600  012777  177741  170452            MOV     #-31.,@LSH              ;LOAD SHIFT COUNT (LSH) WITH -31.
1467  007606  022777  000000  170430            CMP     #0,@AC                  ;COMPARE AC WITH 0
1468  007614  001401                            BEQ     70$             ;IF NO.ERROR SKIP HLT
1469  007616  104000                            HLT                     ;CALL ERROR ROUTINE
1470  007620                            70$:
1471  007620  022777  000001  170420            CMP     #1,@MQ                  ;COMPARE MQ WITH 1
```

```
1472  007626  001401                        BEQ     71$             ;IF NO.ERROR SKIP HLT
1473  007630  104000                        HLT                     ;CALL ERROR ROUTINE
1474  007632                          71$:
1475  007632  122777  000023  170414        CMPB    #23,@SR                 ;COMPARE SR WITH 23
1476  007640  001401                        BEQ     72$             ;IF NO.ERROR SKIP HLT
1477  007642  104000                        HLT                     ;CALL ERROR ROUTINE
1478  007644                          72$:
1479
1480
1481
1482  007644  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1483  007646  012777  000000  170372        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1484  007654  012777  125252  170362        MOV     #125252,@AC             ;LOAD AC WITH 125252
1485  007662  012777  177760  170370        MOV     #-16.,@LSH              ;LOAD SHIFT COUNT (LSH) WITH -16.
1486  007670  022777  000000  170346        CMP     #0,@AC                  ;COMPARE AC WITH 0
1487  007676  001401                        BEQ     73$             ;IF NO.ERROR SKIP HLT
1488  007700  104000                        HLT                     ;CALL ERROR ROUTINE
1489  007702                          73$:
1490  007702  022777  125252  170336        CMP     #125252,@MQ             ;COMPARE MQ WITH 125252
1491  007710  001401                        BEQ     74$             ;IF NO.ERROR SKIP HLT
1492  007712  104000                        HLT                     ;CALL ERROR ROUTINE
1493  007714                          74$:
1494  007714  122777  000020  170332        CMPB    #20,@SR                 ;COMPARE SR WITH 20
1495  007722  001401                        BEQ     75$             ;IF NO.ERROR SKIP HLT
1496  007724  104000                        HLT                     ;CALL ERROR ROUTINE
1497  007726                          75$:
1498
1499
1500
1501  007726  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1502  007730  012777  000000  170310        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1503  007736  012777  052525  170300        MOV     #52525,@AC              ;LOAD AC WITH 52525
1504  007744  012777  177777  170306        MOV     #-1,@LSH                ;LOAD SHIFT COUNT (LSH) WITH -1
1505  007752  022777  025252  170264        CMP     #25252,@AC              ;COMPARE AC WITH 25252
1506  007760  001401                        BEQ     76$             ;IF NO.ERROR SKIP HLT
1507  007762  104000                        HLT                     ;CALL ERROR ROUTINE
1508  007764                          76$:
1509  007764  022777  100000  170254        CMP     #100000,@MQ             ;COMPARE MQ WITH 100000
1510  007772  001401                        BEQ     77$             ;IF NO.ERROR SKIP HLT
1511  007774  104000                        HLT                     ;CALL ERROR ROUTINE
1512  007776                          77$:
1513  007776  122777  000000  170250        CMPB    #0,@SR                  ;COMPARE SR WITH 0
```

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1514  010004  001401                        BEQ     78$             ;IF NO.ERROR SKIP HLT
1515  010006  104000                        HLT                     ;CALL ERROR ROUTINE
1516  010010                          78$:
1517
1518  010010  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1519  010012  012777  000000  170226        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1520  010020  012777  100000  170216        MOV     #100000,@AC             ;LOAD AC WITH 100000
1521  010026  012777  177742  170224        MOV     #177742,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177742
1522  010034  022777  000000  170202        CMP     #0,@AC                  ;COMPARE AC WITH 0
1523  010042  001401                        BEQ     79$             ;IF NO.ERROR SKIP HLT
1524  010044  104000                        HLT                     ;CALL ERROR ROUTINE
1525  010046                          79$:
1526  010046  022777  000002  170172        CMP     #2,@MQ                  ;COMPARE MQ WITH 2
1527  010054  001401                        BEQ     80$             ;IF NO.ERROR SKIP HLT
1528  010056  104000                        HLT                     ;CALL ERROR ROUTINE
1529  010060                          80$:
1530  010060  122777  000022  170166        CMPB    #22,@SR                 ;COMPARE SR WITH 22
1531  010066  001401                        BEQ     81$             ;IF NO.ERROR SKIP HLT
1532  010070  104000                        HLT                     ;CALL ERROR ROUTINE
1533  010072                          81$:
1534
1535  010072  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1536  010074  012777  000000  170144        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1537  010102  012777  100000  170134        MOV     #100000,@AC             ;LOAD AC WITH 100000
1538  010110  012777  177743  170142        MOV     #177743,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177743
1539  010116  022777  000000  170120        CMP     #0,@AC                  ;COMPARE AC WITH 0
1540  010124  001401                        BEQ     82$             ;IF NO.ERROR SKIP HLT
1541  010126  104000                        HLT                     ;CALL ERROR ROUTINE
1542  010130                          82$:
1543  010130  022777  000004  170110        CMP     #4,@MQ                  ;COMPARE MQ WITH 4
1544  010136  001401                        BEQ     83$             ;IF NO.ERROR SKIP HLT
1545  010140  104000                        HLT                     ;CALL ERROR ROUTINE
1546  010142                          83$:
1547  010142  122777  000022  170104        CMPB    #22,@SR                 ;COMPARE SR WITH 22
1548  010150  001401                        BEQ     84$             ;IF NO.ERROR SKIP HLT
1549  010152  104000                        HLT                     ;CALL ERROR ROUTINE
1550  010154                          84$:
1551
1552
1553  010154  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1554  010156  012777  000000  170062        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1555  010164  012777  100000  170052        MOV     #100000,@AC             ;LOAD AC WITH 100000
1556  010172  012777  177744  170060        MOV     #177744,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177744
1557  010200  022777  000000  170036        CMP     #0,@AC                  ;COMPARE AC WITH 0
1558  010206  001401                        BEQ     85$             ;IF NO.ERROR SKIP HLT
1559  010210  104000                        HLT                     ;CALL ERROR ROUTINE
1560  010212                          85$:
1561  010212  022777  000010  170026        CMP     #10,@MQ                 ;COMPARE MQ WITH 10
1562  010220  001401                        BEQ     86$             ;IF NO.ERROR SKIP HLT
1563  010222  104000                        HLT                     ;CALL ERROR ROUTINE
1564  010224                          86$:
1565  010224  122777  000022  170022        CMPB    #22,@SR                 ;COMPARE SR WITH 22
```

```
1566  010232  001401                        BEQ     87$             ;IF NO.ERROR SKIP HLT
1567  010234  104000                        HLT                     ;CALL ERROR ROUTINE
1568  010236                          87$:
1569  010236  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1570  010240  012777  000000  170000        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1571  010246  012777  100000  167770        MOV     #100000,@AC             ;LOAD AC WITH 100000
1572  010254  012777  177745  167776        MOV     #177745,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177745
1573  010262  022777  000000  167754        CMP     #0,@AC                  ;COMPARE AC WITH 0
1574  010270  001401                        BEQ     88$             ;IF NO.ERROR SKIP HLT
1575  010272  104000                        HLT                     ;CALL ERROR ROUTINE
1576  010274                          88$:
1577  010274  022777  000020  167744        CMP     #20,@MQ                 ;COMPARE MQ WITH 20
1578  010302  001401                        BEQ     89$             ;IF NO.ERROR SKIP HLT
1579  010304  104000                        HLT                     ;CALL ERROR ROUTINE
1580  010306                          89$:
1581  010306  122777  000022  167740        CMPB    #22,@SR                 ;COMPARE SR WITH 22
1582  010314  001401                        BEQ     90$             ;IF NO.ERROR SKIP HLT
1583  010316  104000                        HLT                     ;CALL ERROR ROUTINE
1584  010320                          90$:
1585
1586
1587  010320  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1588  010322  012777  000000  167716        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1589  010330  012777  100000  167706        MOV     #100000,@AC             ;LOAD AC WITH 100000
1590  010336  012777  177746  167714        MOV     #177746,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177746
1591  010344  022777  000000  167672        CMP     #0,@AC                  ;COMPARE AC WITH 0
1592  010352  001401                        BEQ     91$             ;IF NO.ERROR SKIP HLT
1593  010354  104000                        HLT                     ;CALL ERROR ROUTINE
1594  010356                          91$:
1595  010356  022777  000040  167662        CMP     #40,@MQ                 ;COMPARE MQ WITH 40
1596  010364  001401                        BEQ     92$             ;IF NO.ERROR SKIP HLT
1597  010366  104000                        HLT                     ;CALL ERROR ROUTINE
1598  010370                          92$:
1599  010370  122777  000022  167656        CMPB    #22,@SR                 ;COMPARE SR WITH 22
1600  010376  001401                        BEQ     93$             ;IF NO.ERROR SKIP HLT
1601  010400  104000                        HLT                     ;CALL ERROR ROUTINE
1602  010402                          93$:
1603
1604
1605  010402  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1606  010404  012777  000000  167634        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1607  010412  012777  100000  167624        MOV     #100000,@AC             ;LOAD AC WITH 100000
1608  010420  012777  177747  167632        MOV     #177747,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177747
1609  010426  022777  000000  167610        CMP     #0,@AC                  ;COMPARE AC WITH 0
1610  010434  001401                        BEQ     94$             ;IF NO.ERROR SKIP HLT
1611  010436  104000                        HLT                     ;CALL ERROR ROUTINE
1612  010440                          94$:
1613  010440  022777  000100  167600        CMP     #100,@MQ                ;COMPARE MQ WITH 100
1614  010446  001401                        BEQ     95$             ;IF NO.ERROR SKIP HLT
1615  010450  104000                        HLT                     ;CALL ERROR ROUTINE
1616  010452                          95$:
1617  010452  122777  000022  167574        CMPB    #22,@SR                 ;COMPARE SR WITH 22
```

```
1618  010460  001401                        BEQ     96$             ;IF NO.ERROR SKIP HLT
1619  010462  104000                        HLT                     ;CALL ERROR ROUTINE
1620  010464                          96$:
1621  010464  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1622  010466  012777  000000  167552        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1623  010474  012777  100000  167542        MOV     #100000,@AC             ;LOAD AC WITH 100000
1624  010502  012777  177750  167550        MOV     #177750,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177750
1625  010510  022777  000000  167526        CMP     #0,@AC                  ;COMPARE AC WITH 0
1626  010516  001401                        BEQ     97$             ;IF NO.ERROR SKIP HLT
1627  010520  104000                        HLT                     ;CALL ERROR ROUTINE
1628  010522                          97$:
1629  010522  022777  000200  167516        CMP     #200,@MQ                ;COMPARE MQ WITH 200
1630  010530  001401                        BEQ     98$             ;IF NO.ERROR SKIP HLT
1631  010532  104000                        HLT                     ;CALL ERROR ROUTINE
1632  010534                          98$:
1633  010534  122777  000022  167512        CMPB    #22,@SR                 ;COMPARE SR WITH 22
1634  010542  001401                        BEQ     99$             ;IF NO.ERROR SKIP HLT
1635  010544  104000                        HLT                     ;CALL ERROR ROUTINE
1636  010546                          99$:
1637
1638
1639  010546  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1640  010550  012777  000000  167470        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1641  010556  012777  100000  167460        MOV     #100000,@AC             ;LOAD AC WITH 100000
1642  010564  012777  177751  167466        MOV     #177751,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177751
1643  010572  022777  000000  167444        CMP     #0,@AC                  ;COMPARE AC WITH 0
1644  010600  001401                        BEQ     100$            ;IF NO.ERROR SKIP HLT
1645  010602  104000                        HLT                     ;CALL ERROR ROUTINE
1646  010604                          100$:
1647  010604  022777  000400  167434        CMP     #400,@MQ                ;COMPARE MQ WITH 400
1648  010612  001401                        BEQ     101$            ;IF NO.ERROR SKIP HLT
1649  010614  104000                        HLT                     ;CALL ERROR ROUTINE
1650  010616                          101$:
1651  010616  122777  000022  167430        CMPB    #22,@SR                 ;COMPARE SR WITH 22
1652  010624  001401                        BEQ     102$            ;IF NO.ERROR SKIP HLT
1653  010626  104000                        HLT                     ;CALL ERROR ROUTINE
1654  010630                          102$:
1655
1656
1657  010630  104400                        SCOPE                           ;TEST OF LOGICAL SHIFT
1658  010632  012777  000000  167406        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1659  010640  012777  100000  167376        MOV     #100000,@AC             ;LOAD AC WITH 100000
1660  010646  012777  177752  167404        MOV     #177752,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177752
1661  010654  022777  000000  167362        CMP     #0,@AC                  ;COMPARE AC WITH 0
1662  010662  001401                        BEQ     103$            ;IF NO.ERROR SKIP HLT
1663  010664  104000                        HLT                     ;CALL ERROR ROUTINE
1664  010666                          103$:
1665  010666  022777  001000  167352        CMP     #1000,@MQ               ;COMPARE MQ WITH 1000
1666  010674  001401                        BEQ     104$            ;IF NO.ERROR SKIP HLT
1667  010676  104000                        HLT                     ;CALL ERROR ROUTINE
1668  010700                          104$:
1669  010700  122777  000022  167346        CMPB    #22,@SR                 ;COMPARE SR WITH 22
```

```
1670  010706  001401                          BEQ     105$            ;IF NO.ERROR SKIP HLT
1671  010710  104000                          HLT                     ;CALL ERROR ROUTINE
1672  010712                          105$:
1673  010712  104400                          SCOPE                           ;TEST OF LOGICAL SHIFT
1674  010714  012777  000000  167324          MOV     #0,@MQ                  ;LOAD MQ WITH 0
1675  010722  012777  100000  167314          MOV     #100000,@AC             ;LOAD AC WITH 100000
1676  010730  012777  177753  167322          MOV     #177753,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177753
1677  010736  022777  000000  167300          CMP     #0,@AC                  ;COMPARE AC WITH 0
1678  010744  001401                          BEQ     106$            ;IF NO.ERROR SKIP HLT
1679  010746  104000                          HLT                     ;CALL ERROR ROUTINE
1680  010750                          106$:
1681  010750  022777  002000  167270          CMP     #2000,@MQ               ;COMPARE MQ WITH 2000
1682  010756  001401                          BEQ     107$            ;IF NO.ERROR SKIP HLT
1683  010760  104000                          HLT                     ;CALL ERROR ROUTINE
1684  010762                          107$:
1685  010762  122777  000022  167264          CMPB    #22,@SR                 ;COMPARE SR WITH 22
1686  010770  001401                          BEQ     108$            ;IF NO.ERROR SKIP HLT
1687  010772  104000                          HLT                     ;CALL ERROR ROUTINE
1688  010774                          108$:
1689
1690
1691  010774  104400                          SCOPE                           ;TEST OF LOGICAL SHIFT
1692  010776  012777  000000  167242          MOV     #0,@MQ                  ;LOAD MQ WITH 0
1693  011004  012777  100000  167232          MOV     #100000,@AC             ;LOAD AC WITH 100000
1694  011012  012777  177754  167240          MOV     #177754,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177754
1695  011020  022777  000000  167216          CMP     #0,@AC                  ;COMPARE AC WITH 0
1696  011026  001401                          BEQ     109$            ;IF NO.ERROR SKIP HLT
1697  011030  104000                          HLT                     ;CALL ERROR ROUTINE
1698  011032                          109$:
1699  011032  022777  004000  167206          CMP     #4000,@MQ               ;COMPARE MQ WITH 4000
1700  011040  001401                          BEQ     110$            ;IF NO.ERROR SKIP HLT
1701  011042  104000                          HLT                     ;CALL ERROR ROUTINE
1702  011044                          110$:
1703  011044  122777  000022  167202          CMPB    #22,@SR                 ;COMPARE SR WITH 22
1704  011052  001401                          BEQ     111$            ;IF NO.ERROR SKIP HLT
1705  011054  104000                          HLT                     ;CALL ERROR ROUTINE
1706  011056                          111$:
1707
1708
1709  011056  104400                          SCOPE                           ;TEST OF LOGICAL SHIFT
1710  011060  012777  000000  167160          MOV     #0,@MQ                  ;LOAD MQ WITH 0
1711  011066  012777  100000  167150          MOV     #100000,@AC             ;LOAD AC WITH 100000
1712  011074  012777  177755  167156          MOV     #177755,@LSH            ;LOAD SHIFT COUNT (LSH) WITH 177755
1713  011102  022777  000000  167134          CMP     #0,@AC                  ;COMPARE AC WITH 0
1714  011110  001401                          BEQ     112$            ;IF NO.ERROR SKIP HLT
1715  011112  104000                          HLT                     ;CALL ERROR ROUTINE
1716  011114                          112$:
1717  011114  022777  010000  167124          CMP     #10000,@MQ              ;COMPARE MQ WITH 10000
1718  011122  001401                          BEQ     113$            ;IF NO.ERROR SKIP HLT
1719  011124  104000                          HLT                     ;CALL ERROR ROUTINE
1720  011126                          113$:
1721  011126  122777  000022  167120          CMPB    #22,@SR                 ;COMPARE SR WITH 22
1722  011134  001401                          BEQ     114$            ;IF NO.ERROR SKIP HLT
1723  011136  104000                          HLT                     ;CALL ERROR ROUTINE
1724  011140                          114$:
1725
```

```
                                ;;*****************************************************************
                                ;       AT THIS POINT, THE LOGICAL SHIFT WORKS
                                ;;*****************************************************************

                                ;;*****************************************************************
                                ;       TEST OF ARITHMETIC SHIFT

                                ;       SHIFT RIGHT
                                ;;*****************************************************************
011140                          ASR:

011140  104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
011142  012777  000000  167076          MOV     #0,@MQ                  ;LOAD MQ WITH 0
011150  012777  000000  167066          MOV     #0,@AC                  ;LOAD AC WITH 0
011156  012777  177760  167076          MOV     #-16.,@ASH              ;LOAD SHIFT COUNT (ASH) WITH -16.
011164  022777  000000  167052          CMP     #0,@AC                  ;COMPARE AC WITH 0
011172  001401                          BEQ     64$             ;IF NO.ERROR SKIP HLT
011174  104000                          HLT                     ;CALL ERROR ROUTINE
011176                          64$:
011176  022777  000000  167042          CMP     #0,@MQ                  ;COMPARE MQ WITH 0
011204  001401                          BEQ     65$             ;IF NO.ERROR SKIP HLT
011206  104000                          HLT                     ;CALL ERROR ROUTINE
011210                          65$:
011210  122777  000036  167036          CMPB    #36,@SR                 ;COMPARE SR WITH 36
011216  001401                          BEQ     66$             ;IF NO.ERROR SKIP HLT
011220  104000                          HLT                     ;CALL ERROR ROUTINE
011222                          66$:


011222  104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
011224  012777  000000  167014          MOV     #0,@MQ                  ;LOAD MQ WITH 0
011232  012777  177777  167004          MOV     #-1,@AC                 ;LOAD AC WITH -1
011240  012777  177760  167014          MOV     #-16.,@ASH              ;LOAD SHIFT COUNT (ASH) WITH -16.
011246  022777  177777  166770          CMP     #-1,@AC                 ;COMPARE AC WITH -1
011254  001401                          BEQ     67$             ;IF NO.ERROR SKIP HLT
011256  104000                          HLT                     ;CALL ERROR ROUTINE
011260                          67$:
011260  022777  177777  166760          CMP     #-1,@MQ                 ;COMPARE MQ WITH -1
011266  001401                          BEQ     68$             ;IF NO.ERROR SKIP HLT
011270  104000                          HLT                     ;CALL ERROR ROUTINE
011272                          68$:
011272  122777  000342  166754          CMPB    #342,@SR                ;COMPARE SR WITH 342
011300  001401                          BEQ     69$             ;IF NO.ERROR SKIP HLT
011302  104000                          HLT                     ;CALL ERROR ROUTINE
011304                          69$:


011304  104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
011306  012777  000000  166732          MOV     #0,@MQ                  ;LOAD MQ WITH 0
011314  012777  125252  166722          MOV     #125252,@AC             ;LOAD AC WITH 125252
011322  012777  177760  166732          MOV     #-16.,@ASH              ;LOAD SHIFT COUNT (ASH) WITH -16.
011330  022777  177777  166706          CMP     #-1,@AC                 ;COMPARE AC WITH -1
011336  001401                          BEQ     70$             ;IF NO.ERROR SKIP HLT
011340  104000                          HLT                     ;CALL ERROR ROUTINE
```

```
1782  011342                          70$:
1783  011342  022777  125252  166676          CMP     #125252,@MQ             ;COMPARE MQ WITH 125252
1784  011350  001401                          BEQ     71$             ;IF NO.ERROR SKIP HLT
1785  011352  104000                          HLT                     ;CALL ERROR ROUTINE
1786  011354                          71$:
1787  011354  122777  000342  166672          CMPB    #342,@SR                ;COMPARE SR WITH 342
1788  011362  001401                          BEQ     72$             ;IF NO.ERROR SKIP HLT
1789  011364  104000                          HLT                     ;CALL ERROR ROUTINE
1790  011366                          72$:
1791  011366  104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
1792  011370  012777  000000  166650          MOV     #0,@MQ                  ;LOAD MQ WITH 0
1793  011376  012777  052525  166640          MOV     #52525,@AC              ;LOAD AC WITH 52525
1794  011404  012777  177760  166650          MOV     #-16.,@ASH              ;LOAD SHIFT COUNT (ASH) WITH -16.
1795  011412  022777  000000  166624          CMP     #0,@AC                  ;COMPARE AC WITH 0
1796  011420  001401                          BEQ     73$             ;IF NO.ERROR SKIP HLT
1797  011422  104000                          HLT                     ;CALL ERROR ROUTINE
1798  011424                          73$:
1799  011424  022777  052525  166614          CMP     #52525,@MQ              ;COMPARE MQ WITH 52525
1800  011432  001401                          BEQ     74$             ;IF NO.ERROR SKIP HLT
1801  011434  104000                          HLT                     ;CALL ERROR ROUTINE
1802  011436                          74$:
1803  011436  122777  000022  166610          CMPB    #22,@SR                 ;COMPARE SR WITH 22
1804  011444  001401                          BEQ     75$             ;IF NO.ERROR SKIP HLT
1805  011446  104000                          HLT                     ;CALL ERROR ROUTINE
1806  011450                          75$:
1807
1808
1809
1810  011450  104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
1811  011452  012777  000000  166566          MOV     #0,@MQ                  ;LOAD MQ WITH 0
1812  011460  012777  100000  166556          MOV     #100000,@AC             ;LOAD AC WITH 100000
1813  011466  012777  177740  166566          MOV     #-32.,@ASH              ;LOAD SHIFT COUNT (ASH) WITH -32.
1814  011474  022777  177777  166542          CMP     #-1,@AC                 ;COMPARE AC WITH -1
1815  011502  001401                          BEQ     76$             ;IF NO.ERROR SKIP HLT
1816  011504  104000                          HLT                     ;CALL ERROR ROUTINE
1817  011506                          76$:
1818  011506  022777  177777  166532          CMP     #-1,@MQ                 ;COMPARE MQ WITH -1
1819  011514  001401                          BEQ     77$             ;IF NO.ERROR SKIP HLT
1820  011516  104000                          HLT                     ;CALL ERROR ROUTINE
1821  011520                          77$:
1822  011520  122777  000343  166526          CMPB    #343,@SR                ;COMPARE SR WITH 343
1823  011526  001401                          BEQ     78$             ;IF NO.ERROR SKIP HLT
1824  011530  104000                          HLT                     ;CALL ERROR ROUTINE
1825  011532                          78$:
1826
1827
```

```
1828                                    ;;*****************************************************************
1829                                    ;       SHIFT LEFT
1830                                    ;*****************************************************************
1831   011532                           ASL:
1832   011532  104400                           SCOPE                           ;TEST OF ARITHMETIC SHIFT
1833   011534  012777  000000  166504           MOV     #0,@MQ                  ;LOAD MQ WITH 0
1834   011542  012777  000000  166474           MOV     #0,@AC                  ;LOAD AC WITH 0
1835   011550  012777  000020  166504           MOV     #16.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 16.
1836   011556  022777  000000  166460           CMP     #0,@AC                  ;COMPARE AC WITH 0
1837   011564  001401                           BEQ     64$             ;IF NO.ERROR SKIP HLT
1838   011566  104000                           HLT                     ;CALL ERROR ROUTINE
1839   011570                           64$:
1840   011570  022777  000000  166450           CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1841   011576  001401                           BEQ     65$             ;IF NO.ERROR SKIP HLT
1842   011600  104000                           HLT                     ;CALL ERROR ROUTINE
1843   011602                           65$:
1844   011602  122777  000036  166444           CMPB    #36,@SR                 ;COMPARE SR WITH 36
1845   011610  001401                           BEQ     66$             ;IF NO.ERROR SKIP HLT
1846   011612  104000                           HLT                     ;CALL ERROR ROUTINE
1847   011614                           66$:
1848   011614  104400                           SCOPE                           ;TEST OF ARITHMETIC SHIFT
1849   011616  012777  177777  166422           MOV     #-1,@MQ                 ;LOAD MQ WITH -1
1850   011624  012777  000000  166412           MOV     #0,@AC                  ;LOAD AC WITH 0
1851   011632  012777  000017  166422           MOV     #15.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 15.
1852   011640  022777  077777  166376           CMP     #77777,@AC              ;COMPARE AC WITH 77777
1853   011646  001401                           BEQ     67$             ;IF NO.ERROR SKIP HLT
1854   011650  104000                           HLT                     ;CALL ERROR ROUTINE
1855   011652                           67$:
1856   011652  022777  100000  166366           CMP     #100000,@MQ             ;COMPARE MQ WITH 100000
1857   011660  001401                           BEQ     68$             ;IF NO.ERROR SKIP HLT
1858   011662  104000                           HLT                     ;CALL ERROR ROUTINE
1859   011664                           68$:
1860   011664  122777  000000  166362           CMPB    #0,@SR                  ;COMPARE SR WITH 0
1861   011672  001401                           BEQ     69$             ;IF NO.ERROR SKIP HLT
1862   011674  104000                           HLT                     ;CALL ERROR ROUTINE
1863   011676                           69$:
1864
1865   011676  104400                           SCOPE                           ;TEST OF ARITHMETIC SHIFT
1866   011700  012777  177777  166340           MOV     #-1,@MQ                 ;LOAD MQ WITH -1
1867   011706  012777  000000  166330           MOV     #0,@AC                  ;LOAD AC WITH 0
1868   011714  012777  000020  166340           MOV     #16.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 16.
1869   011722  022777  077777  166314           CMP     #77777,@AC              ;COMPARE AC WITH 77777
1870   011730  001401                           BEQ     70$             ;IF NO.ERROR SKIP HLT
1871   011732  104000                           HLT                     ;CALL ERROR ROUTINE
1872   011734                           70$:
1873   011734  022777  000000  166304           CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1874   011742  001401                           BEQ     71$             ;IF NO.ERROR SKIP HLT
1875   011744  104000                           HLT                     ;CALL ERROR ROUTINE
1876   011746                           71$:
1877   011746  122777  000211  166300           CMPB    #211,@SR                ;COMPARE SR WITH 211
```

```
1678  011754  001401                        BEQ     72$             ;IF NO.ERROR SKIP HLT
1879  011756  104000                        HLT                     ;CALL ERROR ROUTINE
1880  011760                          72$:
1881
1882  011760  104400                        SCOPE                           ;TEST OF ARITHMETIC SHIFT
1883  011762  012777  177776  166256        MOV     #-2,@MQ                 ;LOAD MQ WITH -2
1884  011770  012777  100000  166246        MOV     #100000,@AC             ;LOAD AC WITH 100000
1885  011776  012777  000017  166256        MOV     #15.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 15.
1886  012004  022777  177777  166232        CMP     #-1,@AC                 ;COMPARE AC WITH -1
1887  012012  001401                        BEQ     73$             ;IF NO.ERROR SKIP HLT
1888  012014  104000                        HLT                     ;CALL ERROR ROUTINE
1889  012016                          73$:
1890  012016  022777  000000  166222        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1891  012024  001401                        BEQ     74$             ;IF NO.ERROR SKIP HLT
1892  012026  104000                        HLT                     ;CALL ERROR ROUTINE
1893  012030                          74$:
1894  012030  122777  000150  166216        CMPB    #150,@SR                ;COMPARE SR WITH 150
1895  012036  001401                        BEQ     75$             ;IF NO.ERROR SKIP HLT
1896  012040  104000                        HLT                     ;CALL ERROR ROUTINE
1897  012042                          75$:
1898  012042  104400                        SCOPE                           ;TEST OF ARITHMETIC SHIFT
1899  012044  012777  125252  166174        MOV     #125252,@MQ             ;LOAD MQ WITH 125252
1900  012052  012777  000000  166164        MOV     #0,@AC                  ;LOAD AC WITH 0
1901  012060  012777  000017  166174        MOV     #15.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 15.
1902  012066  022777  052525  166150        CMP     #52525,@AC              ;COMPARE AC WITH 52525
1903  012074  001401                        BEQ     76$             ;IF NO.ERROR SKIP HLT
1904  012076  104000                        HLT                     ;CALL ERROR ROUTINE
1905  012100                          76$:
1906  012100  022777  000000  166140        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1907  012106  001401                        BEQ     77$             ;IF NO.ERROR SKIP HLT
1908  012110  104000                        HLT                     ;CALL ERROR ROUTINE
1909  012112                          77$:
1910  012112  122777  000010  166134        CMPB    #10,@SR                 ;COMPARE SR WITH 10
1911  012120  001401                        BEQ     78$             ;IF NO.ERROR SKIP HLT
1912  012122  104000                        HLT                     ;CALL ERROR ROUTINE
1913  012124                          78$:
1914
1915  012124  104400                        SCOPE                           ;TEST OF ARITHMETIC SHIFT
1916  012126  012777  125252  166112        MOV     #125252,@MQ             ;LOAD MQ WITH 125252
1917  012134  012777  000000  166102        MOV     #0,@AC                  ;LOAD AC WITH 0
1918  012142  012777  000020  166112        MOV     #16.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 16.
1919  012150  022777  025252  166066        CMP     #25252,@AC              ;COMPARE AC WITH 25252
1920  012156  001401                        BEQ     79$             ;IF NO.ERROR SKIP HLT
1921  012160  104000                        HLT                     ;CALL ERROR ROUTINE
1922  012162                          79$:
1923  012162  022777  000000  166056        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
```

```
1924   012170   001401                          BEQ     80$             ;IF NO.ERROR SKIP HLT
1925   012172   104000                          HLT                     ;CALL ERROR ROUTINE
1926   012174                           80$:
1927   012174   122777   000211   166052        CMPB    #211,@SR                ;COMPARE SR WITH 211
1928   012202   001401                          BEQ     81$             ;IF NO.ERROR SKIP HLT
1929   012204   104000                          HLT                     ;CALL ERROR ROUTINE
1930   012206                           81$:
1931   012206   104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
1932   012210   012777   052525   166030        MOV     #52525,@MQ              ;LOAD MQ WITH 52525
1933   012216   012777   000000   166020        MOV     #0,@AC                  ;LOAD AC WITH 0
1934   012224   012777   000020   166030        MOV     #16.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 16.
1935   012232   022777   052525   166004        CMP     #52525,@AC              ;COMPARE AC WITH 52525
1936   012240   001401                          BEQ     82$             ;IF NO.ERROR SKIP HLT
1937   012242   104000                          HLT                     ;CALL ERROR ROUTINE
1938   012244                           82$:
1939   012244   022777   000000   165774        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1940   012252   001401                          BEQ     83$             ;IF NO.ERROR SKIP HLT
1941   012254   104000                          HLT                     ;CALL ERROR ROUTINE
1942   012256                           83$:
1943   012256   122777   000010   165770        CMPB    #10,@SR                 ;COMPARE SR WITH 10
1944   012264   001401                          BEQ     84$             ;IF NO.ERROR SKIP HLT
1945   012266   104000                          HLT                     ;CALL ERROR ROUTINE
1946   012270                           84$:
1947
1948   012270   104400                          SCOPE                           ;TEST OF ARITHMETIC SHIFT
1949   012272   012777   000000   165746        MOV     #0,@MQ                  ;LOAD MQ WITH 0
1950   012300   012777   177777   165736        MOV     #-1,@AC                 ;LOAD AC WITH -1
1951   012306   012777   000020   165746        MOV     #16.,@ASH               ;LOAD SHIFT COUNT (ASH) WITH 16.
1952   012314   022777   100000   165722        CMP     #100000,@AC             ;COMPARE AC WITH 100000
1953   012322   001401                          BEQ     85$             ;IF NO.ERROR SKIP HLT
1954   012324   104000                          HLT                     ;CALL ERROR ROUTINE
1955   012326                           85$:
1956   012326   022777   000000   165712        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1957   012334   001401                          BEQ     86$             ;IF NO.ERROR SKIP HLT
1958   012336   104000                          HLT                     ;CALL ERROR ROUTINE
1959   012340                           86$:
1960   012340   122777   000110   165706        CMPB    #110,@SR                ;COMPARE SR WITH 110
1961   012346   001401                          BEQ     87$             ;IF NO.ERROR SKIP HLT
1962   012350   104000                          HLT                     ;CALL ERROR ROUTINE
1963   012352                           87$:
```

```
1964                                    ;;*****************************************************************
1965                                    ;       AT THIS POINT, THE ARITHMETIC SHIFT WORKS
1966                                    ;;*****************************************************************
1967                                    ;;*****************************************************************
1968                                    ;       TEST OF NORMALIZE
1969                                    ;*****************************************************************
1970  012352                            NORMAL:
1971
1972  012352  104400                            SCOPE                           ;TEST OF NORMALIZE
1973  012354  012777  000000  165664            MOV     #0,@MQ                  ;LOAD MQ WITH 0
1974  012362  012777  000000  165654            MOV     #0,@AC                  ;LOAD AC WITH 0
1975  012370  005077  165662                    CLR     @NOR                    ;START NORMALIZE
1976  012374  022777  000000  165642            CMP     #0,@AC                  ;COMPARE AC WITH 0
1977  012402  001401                            BEQ     64$             ;IF NO.ERROR SKIP HLT
1978  012404  104000                            HLT                     ;CALL ERROR ROUTINE
1979  012406                            64$:
1980  012406  022777  000000  165632            CMP     #0,@MQ                  ;COMPARE MQ WITH 0
1981  012414  001401                            BEQ     65$             ;IF NO.ERROR SKIP HLT
1982  012416  104000                            HLT                     ;CALL ERROR ROUTINE
1983  012420                            65$:
1984  012420  022777  017037  165624            CMP     #017037,@SC             ;COMPARE SC WITH 37
1985                                                                    ; AND SR= 36
1986  012426  001401                            BEQ     66$             ;IF NO.ERROR SKIP HLT
1987  012430  104000                            HLT                     ;CALL ERROR ROUTINE
1988  012432                            66$:
1989
1990
1991  012432  104400                            SCOPE                           ;TEST OF NORMALIZE
1992  012434  012777  177777  165604            MOV     #-1,@MQ                 ;LOAD MQ WITH -1
1993  012442  012777  177777  165574            MOV     #-1,@AC                 ;LOAD AC WITH -1
1994  012450  005077  165602                    CLR     @NOR                    ;START NORMALIZE
1995  012454  022777  140000  165562            CMP     #140000,@AC             ;COMPARE AC WITH 140000
1996  012462  001401                            BEQ     67$             ;IF NO.ERROR SKIP HLT
1997  012464  104000                            HLT                     ;CALL ERROR ROUTINE
1998  012466                            67$:
1999  012466  022777  000000  165552            CMP     #0,@MQ                  ;COMPARE MQ WITH 0
2000  012474  001401                            BEQ     68$             ;IF NO.ERROR SKIP HLT
2001  012476  104000                            HLT                     ;CALL ERROR ROUTINE
2002  012500                            68$:
2003  012500  022777  144036  165544            CMP     #144036,@SC             ;COMPARE SC WITH 30.
2004                                                                    ; AND SR= 310
```

```
2005  012506  001401                        BEQ     69$             ;IF NO.ERROR SKIP HLT
2006  012510  104000                        HLT                     ;CALL ERROR ROUTINE
2007  012512                          69$:
2008  012512  104400                        SCOPE                           ;TEST OF NORMALIZE
2009  012514  012777  000000  165524        MOV     #0,@MQ                  ;LOAD MQ WITH 0
2010  012522  012777  177777  165514        MOV     #-1,@AC                 ;LOAD AC WITH -1
2011  012530  005077  165522                CLR     @NOR                    ;START NORMALIZE
2012  012534  022777  140000  165502        CMP     #140000,@AC             ;COMPARE AC WITH 140000
2013  012542  001401                        BEQ     70$             ;IF NO.ERROR SKIP HLT
2014  012544  104000                        HLT                     ;CALL ERROR ROUTINE
2015  012546                          70$:
2016  012546  022777  000000  165472        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
2017  012554  001401                        BEQ     71$             ;IF NO.ERROR SKIP HLT
2018  012556  104000                        HLT                     ;CALL ERROR ROUTINE
2019  012560                          71$:
2020  012560  022777  144016  165464        CMP     #144016,@SC             ;COMPARE SC WITH 14.
2021                                                                  ; AND SR= 310
2022  012566  001401                        BEQ     72$             ;IF NO.ERROR SKIP HLT
2023  012570  104000                        HLT                     ;CALL ERROR ROUTINE
2024  012572                          72$:
2025
2026
2027
2028  012572  104400                        SCOPE                           ;TEST OF NORMALIZE
2029  012574  012777  000001  165444        MOV     #1,@MQ                  ;LOAD MQ WITH 1
2030  012602  012777  000000  165434        MOV     #0,@AC                  ;LOAD AC WITH 0
2031  012610  005077  165442                CLR     @NOR                    ;START NORMALIZE
2032  012614  022777  040000  165422        CMP     #40000,@AC              ;COMPARE AC WITH 40000
2033  012622  001401                        BEQ     73$             ;IF NO.ERROR SKIP HLT
2034  012624  104000                        HLT                     ;CALL ERROR ROUTINE
2035  012626                          73$:
2036  012626  022777  000000  165412        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
2037  012634  001401                        BEQ     74$             ;IF NO.ERROR SKIP HLT
2038  012636  104000                        HLT                     ;CALL ERROR ROUTINE
2039  012640                          74$:
2040  012640  022777  004036  165404        CMP     #004036,@SC             ;COMPARE SC WITH 30.
2041                                                                  ; AND SR= 10
2042  012646  001401                        BEQ     75$             ;IF NO.ERROR SKIP HLT
2043  012650  104000                        HLT                     ;CALL ERROR ROUTINE
2044  012652                          75$:
2045
2046
2047  012652  104400                        SCOPE                           ;TEST OF NORMALIZE
2048  012654  012777  000005  165364        MOV     #5,@MQ                  ;LOAD MQ WITH 5
2049  012662  012777  000000  165354        MOV     #0,@AC                  ;LOAD AC WITH 0
2050  012670  005077  165362                CLR     @NOR                    ;START NORMALIZE
2051  012674  022777  050000  165342        CMP     #50000,@AC              ;COMPARE AC WITH 50000
```

```
2052  012702  001401                        BEQ     76$             ;IF NO.ERROR SKIP HLT
2053  012704  104000                        HLT                     ;CALL ERROR ROUTINE
2054  012706                          76$:
2055  012706  022777  000000  165332        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
2056  012714  001401                        BEQ     77$             ;IF NO.ERROR SKIP HLT
2057  012716  104000                        HLT                     ;CALL ERROR ROUTINE
2058  012720                          77$:
2059  012720  022777  004034  165324        CMP     #004034,@SC             ;COMPARE SC WITH 28.
2060                                                                  ; AND SR= 10
2061  012726  001401                        BEQ     78$             ;IF NO.ERROR SKIP HLT
2062  012730  104000                        HLT                     ;CALL ERROR ROUTINE
2063  012732                          78$:
2064
2065  012732  104400                        SCOPE                   ;TEST OF NORMALIZE
2066  012734  012777  000001  165304        MOV     #1,@MQ          ;LOAD MQ WITH 1
2067  012742  012777  100000  165274        MOV     #100000,@AC             ;LOAD AC WITH 100000
2068  012750  005077  165302                CLR     @NOR            ;START NORMALIZE
2069  012754  022777  100000  165262        CMP     #100000,@AC             ;COMPARE AC WITH 100000
2070  012762  001401                        BEQ     79$             ;IF NO.ERROR SKIP HLT
2071  012764  104000                        HLT                     ;CALL ERROR ROUTINE
2072  012766                          79$:
2073  012766  022777  000001  165252        CMP     #1,@MQ                  ;COMPARE MQ WITH 1
2074  012774  001401                        BEQ     80$             ;IF NO.ERROR SKIP HLT
2075  012776  104000                        HLT                     ;CALL ERROR ROUTINE
2076  013000                          80$:
2077  013000  022777  140000  165244        CMP     #140000,@SC             ;COMPARE SC WITH 0
2078                                                                  ; AND SR= 300
2079  013006  001401                        BEQ     81$             ;IF NO.ERROR SKIP HLT
2080  013010  104000                        HLT                     ;CALL ERROR ROUTINE
2081  013012                          81$:
2082
2083
2084
2085  013012  104400                        SCOPE                   ;TEST OF NORMALIZE
2086  013014  012777  125252  165224        MOV     #125252,@MQ             ;LOAD MQ WITH 125252
2087  013022  012777  170000  165214        MOV     #170000,@AC             ;LOAD AC WITH 170000
2088  013030  005077  165222                CLR     @NOR            ;START NORMALIZE
2089  013034  022777  100005  165202        CMP     #100005,@AC             ;COMPARE AC WITH 100005
2090  013042  001401                        BEQ     82$             ;IF NO.ERROR SKIP HLT
2091  013044  104000                        HLT                     ;CALL ERROR ROUTINE
2092  013046                          82$:
2093  013046  022777  052520  165172        CMP     #52520,@MQ              ;COMPARE MQ WITH 52520
2094  013054  001401                        BEQ     83$             ;IF NO.ERROR SKIP HLT
2095  013056  104000                        HLT                     ;CALL ERROR ROUTINE
2096  013060                          83$:
2097  013060  022777  140003  165164        CMP     #140003,@SC             ;COMPARE SC WITH 3
2098                                                                  ; AND SR= 300
2099  013066  001401                        BEQ     84$             ;IF NO.ERROR SKIP HLT
2100  013070  104000                        HLT                     ;CALL ERROR ROUTINE
2101  013072                          84$:
```

```
                                ;;*****************************************************************
                                ;       AT THIS POINT NORMALIZE WORKS
                                ;;*****************************************************************



                                ;;*****************************************************************
                                ;       SKIP MULT AND DIVIDE TEST
                                ;       IF BIT 2 IS SET
                                ;;*****************************************************************

013072  004767  004324          JSR     %7,CKSWR                ;CHECK FOR ↑G
013076  032777  000002  165070  BIT     #2,@SWR
013104  001402                  BEQ     .DIV
013106  000167  003042          JMP     .DEV
                                ;;*****************************************************************
                                ;       TEST OF MULTIPLY
                                ;;*****************************************************************
013112                          .DIV:

013112  104400                  SCOPE                           ;TEST OF MULTIPLY
013114  012777  000000  165124  MOV     #0,@MQ                  ;LOAD MQ WITH 0
013122  012777  000000  165120  MOV     #0,@MUL                 ;LOAD MUL WITH 0 AND MULTIPLY
013130  022777  000000  165106  CMP     #0,@AC                  ;COMPARE AC WITH 0
013136  001401                  BEQ     64$             ;IF NO.ERROR SKIP HLT
013140  104000                  HLT                     ;CALL ERROR ROUTINE
013142                  64$:
013142  022777  000000  165076  CMP     #0,@MQ                  ;COMPARE MQ WITH 0
013150  001401                  BEQ     65$             ;IF NO.ERROR SKIP HLT
013152  104000                  HLT                     ;CALL ERROR ROUTINE
013154                  65$:
013154  122777  000036  165072  CMPB    #36,@SR                 ;COMPARE SR WITH 36
```

```
2142  013162  001401                          BEQ     66$             ;IF NO.ERROR SKIP HLT
2143  013164  104000                          HLT                     ;CALL ERROR ROUTINE
2144  013166                          66$:
2145
2146
2147  013166  104400                          SCOPE                           ;TEST OF MULTIPLY
2148  013170  012777  177777  165050          MOV     #-1,@MQ                 ;LOAD MQ WITH -1
2149  013176  012777  000001  165044          MOV     #1,@MUL                 ;LOAD MUL WITH 1 AND MULTIPLY
2150  013204  022777  177777  165032          CMP     #-1,@AC                 ;COMPARE AC WITH -1
2151  013212  001401                          BEQ     67$             ;IF NO.ERROR SKIP HLT
2152  013214  104000                          HLT                     ;CALL ERROR ROUTINE
2153  013216                          67$:
2154  013216  022777  177777  165022          CMP     #-1,@MQ                 ;COMPARE MQ WITH -1
2155  013224  001401                          BEQ     68$             ;IF NO.ERROR SKIP HLT
2156  013226  104000                          HLT                     ;CALL ERROR ROUTINE
2157  013230                          68$:
2158  013230  122777  000342  165016          CMPB    #342,@SR                ;COMPARE SR WITH 342
2159  013236  001401                          BEQ     69$             ;IF NO.ERROR SKIP HLT
2160  013240  104000                          HLT                     ;CALL ERROR ROUTINE
2161  013242                          69$:
2162
2163
2164
2165  013242  104400                          SCOPE                           ;TEST OF MULTIPLY
2166  013244  012777  125252  164774          MOV     #125252,@MQ             ;LOAD MQ WITH 125252
2167  013252  012777  000002  164770          MOV     #2,@MUL                 ;LOAD MUL WITH 2 AND MULTIPLY
2168  013260  022777  177777  164756          CMP     #-1,@AC                 ;COMPARE AC WITH -1
2169  013266  001401                          BEQ     70$             ;IF NO.ERROR SKIP HLT
2170  013270  104000                          HLT                     ;CALL ERROR ROUTINE
2171  013272                          70$:
2172  013272  022777  052524  164746          CMP     #52524,@MQ              ;COMPARE MQ WITH 52524
2173  013300  001401                          BEQ     71$             ;IF NO.ERROR SKIP HLT
2174  013302  104000                          HLT                     ;CALL ERROR ROUTINE
2175  013304                          71$:
2176  013304  122777  000340  164742          CMPB    #340,@SR                ;COMPARE SR WITH 340
```

```
2177  013312  001401                        BEQ     72$             ;IF NO.ERROR SKIP HLT
2178  013314  104000                        HLT                     ;CALL ERROR ROUTINE
2179  013316                          72$:
2180  013316  104400                        SCOPE                           ;TEST OF MULTIPLY
2181  013320  012777  052525  164720        MOV     #52525,@MQ              ;LOAD MQ WITH 52525
2182  013326  012777  000002  164714        MOV     #2,@MUL                 ;LOAD MUL WITH 2 AND MULTIPLY
2183  013334  022777  000000  164702        CMP     #0,@AC                  ;COMPARE AC WITH 0
2184  013342  001401                        BEQ     73$             ;IF NO.ERROR SKIP HLT
2185  013344  104000                        HLT                     ;CALL ERROR ROUTINE
2186  013346                          73$:
2187  013346  022777  125252  164672        CMP     #125252,@MQ             ;COMPARE MQ WITH 125252
2188  013354  001401                        BEQ     74$             ;IF NO.ERROR SKIP HLT
2189  013356  104000                        HLT                     ;CALL ERROR ROUTINE
2190  013360                          74$:
2191  013360  122777  000020  164666        CMPB    #20,@SR                 ;COMPARE SR WITH 20
2192  013366  001401                        BEQ     75$             ;IF NO.ERROR SKIP HLT
2193  013370  104000                        HLT                     ;CALL ERROR ROUTINE
2194  013372                          75$:
2195
2196
2197
2198  013372  104400                        SCOPE                           ;TEST OF MULTIPLY
2199  013374  012777  125252  164644        MOV     #125252,@MQ             ;LOAD MQ WITH 125252
2200  013402  012777  040000  164640        MOV     #40000,@MUL             ;LOAD MUL WITH 40000 AND MULTIPLY
2201  013410  022777  165252  164626        CMP     #165252,@AC             ;COMPARE AC WITH 165252
2202  013416  001401                        BEQ     76$             ;IF NO.ERROR SKIP HLT
2203  013420  104000                        HLT                     ;CALL ERROR ROUTINE
2204  013422                          76$:
2205  013422  022777  100000  164616        CMP     #100000,@MQ             ;COMPARE MQ WITH 100000
2206  013430  001401                        BEQ     77$             ;IF NO.ERROR SKIP HLT
2207  013432  104000                        HLT                     ;CALL ERROR ROUTINE
2208  013434                          77$:
2209  013434  122777  000300  164612        CMPB    #300,@SR                ;COMPARE SR WITH 300
2210  013442  001401                        BEQ     78$             ;IF NO.ERROR SKIP HLT
2211  013444  104000                        HLT                     ;CALL ERROR ROUTINE
2212  013446                          78$:
2213
2214
2215  013446  104400                        SCOPE                           ;TEST OF MULTIPLY
2216  013450  012777  100000  164570        MOV     #100000,@MQ             ;LOAD MQ WITH 100000
2217  013456  012777  100000  164564        MOV     #100000,@MUL            ;LOAD MUL WITH 100000 AND MULTIPLY
2218  013464  022777  040000  164552        CMP     #40000,@AC              ;COMPARE AC WITH 40000
2219  013472  001401                        BEQ     79$             ;IF NO.ERROR SKIP HLT
2220  013474  104000                        HLT                     ;CALL ERROR ROUTINE
2221  013476                          79$:
2222  013476  022777  000000  164542        CMP     #0,@MQ                  ;COMPARE MQ WITH 0
2223  013504  001401                        BEQ     80$             ;IF NO.ERROR SKIP HLT
2224  013506  104000                        HLT                     ;CALL ERROR ROUTINE
2225  013510                          80$:
2226  013510  122777  000010  164536        CMPB    #10,@SR                 ;COMPARE SR WITH 10
2227  013516  001401                        BEQ     81$             ;IF NO.ERROR SKIP HLT
2228  013520  104000                        HLT                     ;CALL ERROR ROUTINE
2229  013522                          81$:
```

```
2230                                    ;;*****************************************************************
2231                                    ;       TEST OF DIVIDE
2232                                    ;*****************************************************************
2233  013522                            DIVIDE:
2234  013522  104400                           SCOPE                           ;TEST OF DIVIDE
2235  013524  005077  164516                   CLR     @MQ                     ;LOAD MQ WITH 0
2236  013530  005077  164506                   CLR     @DIV                    ;LOAD DIV WITH 0 AND DIVIDE
2237  013534  106177  164514                   ROLB    @SR                     ;SHIFT OVERFLOW BIT INTO PS
2238  013540  102401                           BVS     1$                      ;SKIP HALT IF GOOD
2239  013542  104000                           HLT                                     ;HALT ON ERROR
2240  013544                            1$:
2241  013544  005777  164474                   TST     @AC                     ;CHECK AC'S SIGN
2242  013550  100405                           BMI     .MIN
2243  013552  106177  164476                   ROLB    @SR                     ;SET APROPRIATE N AND V BITS
2244  013556  100006                           BPL     .CONT
2245  013560  104000                           HLT                             ;WRONG SIGN
2246  013562  000404                           BR      .CONT
2247  013564  106177  164464           .MIN:   ROLB    @SR                     ;SET APROPRIATE N AND V BITS
2248  013570  100401                           BMI     .CONT
2249  013572  104000                   .HLT:   HLT
2250
2251  013574                            .CONT:
2252  013574  104400                           SCOPE                           ;TEST OF DIVIDE
2253  013576  005077  164444                   CLR     @MQ                     ;CLEAR THE MQ
2254  013602  012777  052525  164434           MOV     #52525,@AC              ;LOAD AC WITH 52525
2255  013610  012777  052525  164424           MOV     #52525,@DIV             ;LOAD DIV WITH 52525 AND DIVIDE
2256  013616  106177  164432                   ROLB    @SR                     ;SHIFT OVERFLOW BIT INTO PS
2257  013622  102401                           BVS     1$                      ;SKIP HALT IF GOOD
2258  013624  104000                           HLT                             ;HALT ON ERROR
2259  013626                            1$:
2260  013626  005777  164412                   TST     @AC                     ;CHECK AC'S SIGN
2261  013632  100405                           BMI     .MIN1
2262  013634  106177  164414                   ROLB    @SR                     ;SET APROPRIATE N AND V BITS
2263  013640  100006                           BPL     .CONT1
2264  013642  104000                           HLT                             ;WRONG SIGN
2265  013644  000404                           BR      .CONT1
2266  013646  106177  164402           .MIN1:  ROLB    @SR                     ;SET APROPRIATE N AND V BITS
2267  013652  100401                           BMI     .CONT1
2268  013654  104000                   .HLT1:  HLT
2269  013656                            .CONT1:
2270  013656  104400                           SCOPE                                   ;TEST OF DIVIDE
2271  013660  012777  177777  164360           MOV     #-1,@MQ                 ;LOAD MQ WITH -1
2272  013666  012777  177777  164350           MOV     #-1,@AC                 ;LOAD AC WITH -1
2273  013674  012777  000001  164340           MOV     #1,@DIV                 ;LOAD DIV WITH 1 AND DIVIDE
2274  013702  022777  000000  164334           CMP     #0,@AC                  ;COMPARE AC WITH 0 (REMAINDER)
2275  013710  001401                           BEQ     64$             ;IF NO.ERROR SKIP HLT
2276  013712  104000                           HLT                     ;CALL ERROR ROUTINE
2277  013714                            64$:
2278  013714  022777  177777  164324           CMP     #-1,@MQ                 ;COMPARE MQ WITH -1 (QUOTIANT)
2279  013722  001401                           BEQ     65$             ;IF NO.ERROR SKIP HLT
2280  013724  104000                           HLT                     ;CALL ERROR ROUTINE
2281  013726                            65$:
2282  013726  122777  000320  164320           CMPB    #320,@SR                ;COMPARE SR WITH 320
2283  013734  001401                           BEQ     66$             ;IF NO.ERROR SKIP HLT
2284  013736  104000                           HLT                     ;CALL ERROR ROUTINE
2285  013740                            66$:
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2286
2287
2288
2289  013740  104400                        SCOPE                   ;TEST OF DIVIDE
2290  013742  012777  000000  164276        MOV     #0,@MQ          ;LOAD MQ WITH 0
2291  013750  012777  000000  164266        MOV     #0,@AC          ;LOAD AC WITH 0
2292  013756  012777  000001  164256        MOV     #1,@DIV         ;LOAD DIV WITH 1 AND DIVIDE
2293  013764  022777  000000  164252        CMP     #0,@AC          ;COMPARE AC WITH 0 (REMAINDER)
2294  013772  001401                        BEQ     67$     ;IF NO.ERROR SKIP HLT
2295  013774  104000                        HLT             ;CALL ERROR ROUTINE
2296  013776                          67$:
2297  013776  022777  000000  164242        CMP     #0,@MQ          ;COMPARE MQ WITH 0 (QUOTIANT)
2298  014004  001401                        BEQ     68$     ;IF NO.ERROR SKIP HLT
2299  014006  104000                        HLT             ;CALL ERROR ROUTINE
2300  014010                          68$:
2301  014010  122777  000036  164236        CMPB    #36,@SR         ;COMPARE SR WITH 36
2302  014016  001401                        BEQ     69$     ;IF NO.ERROR SKIP HLT
2303  014020  104000                        HLT             ;CALL ERROR ROUTINE
2304  014022                          69$:
2305
2306
2307
2308  014022  104400                        SCOPE                   ;TEST OF DIVIDE
2309  014024  012777  125252  164214        MOV     #125252,@MQ     ;LOAD MQ WITH 125252
2310  014032  012777  177777  164204        MOV     #-1,@AC         ;LOAD AC WITH -1
2311  014040  012777  000002  164174        MOV     #2,@DIV         ;LOAD DIV WITH 2 AND DIVIDE
2312  014046  022777  000000  164170        CMP     #0,@AC          ;COMPARE AC WITH 0 (REMAINDER)
2313  014054  001401                        BEQ     70$     ;IF NO.ERROR SKIP HLT
2314  014056  104000                        HLT             ;CALL ERROR ROUTINE
2315  014060                          70$:
2316  014060  022777  152525  164160        CMP     #152525,@MQ     ;COMPARE MQ WITH 152525 (QUOTIANT)
2317  014066  001401                        BEQ     71$     ;IF NO.ERROR SKIP HLT
2318  014070  104000                        HLT             ;CALL ERROR ROUTINE
2319  014072                          71$:
2320  014072  122777  000320  164154        CMPB    #320,@SR        ;COMPARE SR WITH 320
2321  014100  001401                        BEQ     72$     ;IF NO.ERROR SKIP HLT
2322  014102  104000                        HLT             ;CALL ERROR ROUTINE
2323  014104                          72$:
2324  014104  104400                        SCOPE                   ;TEST OF DIVIDE
2325  014106  012777  052525  164132        MOV     #52525,@MQ      ;LOAD MQ WITH 52525
2326  014114  012777  000000  164122        MOV     #0,@AC          ;LOAD AC WITH 0
2327  014122  012777  000002  164112        MOV     #2,@DIV         ;LOAD DIV WITH 2 AND DIVIDE
2328  014130  022777  000001  164106        CMP     #1,@AC          ;COMPARE AC WITH 1 (REMAINDER)
2329  014136  001401                        BEQ     73$     ;IF NO.ERROR SKIP HLT
2330  014140  104000                        HLT             ;CALL ERROR ROUTINE
2331  014142                          73$:
2332  014142  022777  025252  164076        CMP     #25252,@MQ      ;COMPARE MQ WITH 25252 (QUOTIANT)
2333  014150  001401                        BEQ     74$     ;IF NO.ERROR SKIP HLT
2334  014152  104000                        HLT             ;CALL ERROR ROUTINE
2335  014154                          74$:
2336  014154  122777  000000  164072        CMPB    #0,@SR          ;COMPARE SR WITH 0
2337  014162  001401                        BEQ     75$     ;IF NO.ERROR SKIP HLT
2338  014164  104000                        HLT             ;CALL ERROR ROUTINE
2339  014166                          75$:
2340
2341
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2342
2343  014166  104400                          SCOPE                           ;TEST OF DIVIDE
2344  014170  012777  177777  164050          MOV     #-1,@MQ                 ;LOAD MQ WITH -1
2345  014176  012777  177777  164040          MOV     #-1,@AC                 ;LOAD AC WITH -1
2346  014204  012777  177777  164030          MOV     #-1,@DIV                ;LOAD DIV WITH -1 AND DIVIDE
2347  014212  022777  000000  164024          CMP     #0,@AC                  ;COMPARE AC WITH 0 (REMAINDER)
2348  014220  001401                          BEQ     76$             ;IF NO.ERROR SKIP HLT
2349  014222  104000                          HLT                     ;CALL ERROR ROUTINE
2350  014224                          76$:
2351  014224  022777  000001  164014          CMP     #1,@MQ                  ;COMPARE MQ WITH 1 (QUOTIANT)
2352  014232  001401                          BEQ     77$             ;IF NO.ERROR SKIP HLT
2353  014234  104000                          HLT                     ;CALL ERROR ROUTINE
2354  014236                          77$:
2355  014236  122777  000022  164010          CMPB    #22,@SR                 ;COMPARE SR WITH 22
2356  014244  001401                          BEQ     78$             ;IF NO.ERROR SKIP HLT
2357  014246  104000                          HLT                     ;CALL ERROR ROUTINE
2358  014250                          78$:
2359
2360
2361
2362  014250  104400                          SCOPE                           ;TEST OF DIVIDE
2363  014252  012777  000000  163766          MOV     #0,@MQ                  ;LOAD MQ WITH 0
2364  014260  012777  025253  163756          MOV     #25253,@AC              ;LOAD AC WITH 25253
2365  014266  012777  125252  163746          MOV     #125252,@DIV            ;LOAD DIV WITH 125252 AND DIVIDE
2366  014274  022777  000000  163742          CMP     #0,@AC                  ;COMPARE AC WITH 0 (REMAINDER)
2367  014302  001401                          BEQ     79$             ;IF NO.ERROR SKIP HLT
2368  014304  104000                          HLT                     ;CALL ERROR ROUTINE
2369  014306                          79$:
2370  014306  022777  100000  163732          CMP     #100000,@MQ             ;COMPARE MQ WITH 100000 (QUOTIANT)
2371  014314  001401                          BEQ     80$             ;IF NO.ERROR SKIP HLT
2372  014316  104000                          HLT                     ;CALL ERROR ROUTINE
2373  014320                          80$:
2374  014320  122777  000320  163726          CMPB    #320,@SR                ;COMPARE SR WITH 320
2375  014326  001401                          BEQ     81$             ;IF NO.ERROR SKIP HLT
2376  014330  104000                          HLT                     ;CALL ERROR ROUTINE
2377  014332                          81$:
2378  014332  104400                          SCOPE                           ;TEST OF DIVIDE
2379  014334  012777  000001  163704          MOV     #1,@MQ                  ;LOAD MQ WITH 1
2380  014342  012777  025253  163674          MOV     #25253,@AC              ;LOAD AC WITH 25253
2381  014350  012777  125252  163664          MOV     #125252,@DIV            ;LOAD DIV WITH 125252 AND DIVIDE
2382  014356  022777  000001  163660          CMP     #1,@AC                  ;COMPARE AC WITH 1 (REMAINDER)
2383  014364  001401                          BEQ     82$             ;IF NO.ERROR SKIP HLT
2384  014366  104000                          HLT                     ;CALL ERROR ROUTINE
2385  014370                          82$:
2386  014370  022777  100000  163650          CMP     #100000,@MQ             ;COMPARE MQ WITH 100000 (QUOTIANT)
2387  014376  001401                          BEQ     83$             ;IF NO.ERROR SKIP HLT
2388  014400  104000                          HLT                     ;CALL ERROR ROUTINE
2389  014402                          83$:
2390  014402  122777  000300  163644          CMPB    #300,@SR                ;COMPARE SR WITH 300
2391  014410  001401                          BEQ     84$             ;IF NO.ERROR SKIP HLT
2392  014412  104000                          HLT                     ;CALL ERROR ROUTINE
2393  014414                          84$:
2394
2395
2396
2397  014414  104400                          SCOPE                           ;TEST OF DIVIDE
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2398  014416  012777  077777  163622          MOV     #77777,@MQ              ;LOAD MQ WITH 77777
2399  014424  012777  037777  163612          MOV     #37777,@AC              ;LOAD AC WITH 37777
2400  014432  012777  077777  163602          MOV     #77777,@DIV             ;LOAD DIV WITH 77777 AND DIVIDE
2401  014440  022777  077776  163576          CMP     #77776,@AC              ;COMPARE AC WITH 77776 (REMAINDER)
2402  014446  001401                          BEQ     85$             ;IF NO.ERROR SKIP HLT
2403  014450  104000                          HLT                     ;CALL ERROR ROUTINE
2404  014452                          85$:
2405  014452  022777  077777  163566          CMP     #77777,@MQ              ;COMPARE MQ WITH 77777 (QUOTIANT)
2406  014460  001401                          BEQ     86$             ;IF NO.ERROR SKIP HLT
2407  014462  104000                          HLT                     ;CALL ERROR ROUTINE
2408  014464                          86$:
2409  014464  122777  000000  163562          CMPB    #0,@SR                  ;COMPARE SR WITH 0
2410  014472  001401                          BEQ     87$             ;IF NO.ERROR SKIP HLT
2411  014474  104000                          HLT                     ;CALL ERROR ROUTINE
2412  014476                          87$:
2413
2414
2415
2416  014476  104400                          SCOPE                   ;TEST OF DIVIDE
2417  014500  012777  100000  163540          MOV     #100000,@MQ             ;LOAD MQ WITH 100000
2418  014506  012777  000000  163530          MOV     #0,@AC                  ;LOAD AC WITH 0
2419  014514  012777  000002  163520          MOV     #2,@DIV                 ;LOAD DIV WITH 2 AND DIVIDE
2420  014522  022777  000000  163514          CMP     #0,@AC                  ;COMPARE AC WITH 0 (REMAINDER)
2421  014530  001401                          BEQ     88$             ;IF NO.ERROR SKIP HLT
2422  014532  104000                          HLT                     ;CALL ERROR ROUTINE
2423  014534                          88$:
2424  014534  022777  040000  163504          CMP     #40000,@MQ              ;COMPARE MQ WITH 40000 (QUOTIANT)
2425  014542  001401                          BEQ     89$             ;IF NO.ERROR SKIP HLT
2426  014544  104000                          HLT                     ;CALL ERROR ROUTINE
2427  014546                          89$:
2428  014546  122777  000022  163500          CMPB    #22,@SR                 ;COMPARE SR WITH 22
2429  014554  001401                          BEQ     90$             ;IF NO.ERROR SKIP HLT
2430  014556  104000                          HLT                     ;CALL ERROR ROUTINE
2431  014560                          90$:
2432  014560  104400                          SCOPE                   ;TEST OF DIVIDE
2433  014562  012777  100001  163456          MOV     #100001,@MQ             ;LOAD MQ WITH 100001
2434  014570  012777  000000  163446          MOV     #0,@AC                  ;LOAD AC WITH 0
2435  014576  012777  000002  163436          MOV     #2,@DIV                 ;LOAD DIV WITH 2 AND DIVIDE
2436  014604  022777  000001  163432          CMP     #1,@AC                  ;COMPARE AC WITH 1 (REMAINDER)
2437  014612  001401                          BEQ     91$             ;IF NO.ERROR SKIP HLT
2438  014614  104000                          HLT                     ;CALL ERROR ROUTINE
2439  014616                          91$:
2440  014616  022777  040000  163422          CMP     #40000,@MQ              ;COMPARE MQ WITH 40000 (QUOTIANT)
2441  014624  001401                          BEQ     92$             ;IF NO.ERROR SKIP HLT
2442  014626  104000                          HLT                     ;CALL ERROR ROUTINE
2443  014630                          92$:
2444  014630  122777  000000  163416          CMPB    #0,@SR                  ;COMPARE SR WITH 0
2445  014636  001401                          BEQ     93$             ;IF NO.ERROR SKIP HLT
2446  014640  104000                          HLT                     ;CALL ERROR ROUTINE
2447  014642                          93$:
2448
2449
2450
2451  014642  104400                          SCOPE                   ;TEST OF DIVIDE
2452  014644  012777  037776  163374          MOV     #37776,@MQ              ;LOAD MQ WITH 37776
2453  014652  012777  020000  163364          MOV     #20000,@AC              ;LOAD AC WITH 20000
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2454  014660  012777  077777  163354          MOV     #77777,@DIV             ;LOAD DIV WITH 77777 AND DIVIDE
2455  014666  022777  077776  163350          CMP     #77776,@AC              ;COMPARE AC WITH 77776 (REMAINDER)
2456  014674  001401                          BEQ     94$             ;IF NO.ERROR SKIP HLT
2457  014676  104000                          HLT                     ;CALL ERROR ROUTINE
2458  014700                          94$:
2459  014700  022777  040000  163340          CMP     #40000,@MQ              ;COMPARE MQ WITH 40000 (QUOTIANT)
2460  014706  001401                          BEQ     95$             ;IF NO.ERROR SKIP HLT
2461  014710  104000                          HLT                     ;CALL ERROR ROUTINE
2462  014712                          95$:
2463  014712  122777  000000  163334          CMPB    #0,@SR                  ;COMPARE SR WITH 0
2464  014720  001401                          BEQ     96$             ;IF NO.ERROR SKIP HLT
2465  014722  104000                          HLT                     ;CALL ERROR ROUTINE
2466  014724                          96$:
2467
2468
2469  014724  104400                          SCOPE                   ;TEST OF DIVIDE
2470  014726  012777  077777  163312          MOV     #77777,@MQ              ;LOAD MQ WITH 77777
2471  014734  012777  177777  163302          MOV     #177777,@AC             ;LOAD AC WITH 177777
2472  014742  012777  177776  163272          MOV     #177776,@DIV            ;LOAD DIV WITH 177776 AND DIVIDE
2473  014750  022777  177777  163266          CMP     #177777,@AC             ;COMPARE AC WITH 177777 (REMAINDER)
2474  014756  001401                          BEQ     97$             ;IF NO.ERROR SKIP HLT
2475  014760  104000                          HLT                     ;CALL ERROR ROUTINE
2476  014762                          97$:
2477  014762  022777  040000  163256          CMP     #40000,@MQ              ;COMPARE MQ WITH 40000 (QUOTIANT)
2478  014770  001401                          BEQ     98$             ;IF NO.ERROR SKIP HLT
2479  014772  104000                          HLT                     ;CALL ERROR ROUTINE
2480  014774                          98$:
2481  014774  122777  000040  163252          CMPB    #40,@SR                 ;COMPARE SR WITH 40
2482  015002  001401                          BEQ     99$             ;IF NO.ERROR SKIP HLT
2483  015004  104000                          HLT                     ;CALL ERROR ROUTINE
2484  015006                          99$:
2485  015006  104400                          SCOPE                   ;TEST OF DIVIDE
2486  015010  012777  100001  163230          MOV     #100001,@MQ             ;LOAD MQ WITH 100001
2487  015016  012777  157777  163220          MOV     #157777,@AC             ;LOAD AC WITH 157777
2488  015024  012777  100000  163210          MOV     #100000,@DIV            ;LOAD DIV WITH 100000 AND DIVIDE
2489  015032  022777  100001  163204          CMP     #100001,@AC             ;COMPARE AC WITH 100001 (REMAINDER)
2490  015040  001401                          BEQ     100$            ;IF NO.ERROR SKIP HLT
2491  015042  104000                          HLT                     ;CALL ERROR ROUTINE
2492  015044                          100$:
2493  015044  022777  040000  163174          CMP     #40000,@MQ              ;COMPARE MQ WITH 40000 (QUOTIANT)
2494  015052  001401                          BEQ     101$            ;IF NO.ERROR SKIP HLT
2495  015054  104000                          HLT                     ;CALL ERROR ROUTINE
2496  015056                          101$:
2497  015056  122777  000000  163170          CMPB    #0,@SR                  ;COMPARE SR WITH 0
2498  015064  001401                          BEQ     102$            ;IF NO.ERROR SKIP HLT
2499  015066  104000                          HLT                     ;CALL ERROR ROUTINE
2500  015070                          102$:
2501
2502
2503
2504  015070  104400                          SCOPE                   ;TEST OF DIVIDE
2505  015072  012777  052525  163146          MOV     #52525,@MQ              ;LOAD MQ WITH 52525
2506  015100  012777  000000  163136          MOV     #0,@AC                  ;LOAD AC WITH 0
2507  015106  012777  052525  163126          MOV     #52525,@DIV             ;LOAD DIV WITH 52525 AND DIVIDE
2508  015114  022777  000000  163122          CMP     #0,@AC                  ;COMPARE AC WITH 0 (REMAINDER)
2509  015122  001401                          BEQ     103$            ;IF NO.ERROR SKIP HLT
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2510  015124  104000                          HLT                     ;CALL ERROR ROUTINE
2511  015126                        103$:
2512  015126  022777  000001  163112          CMP     #1,@MQ                  ;COMPARE MQ WITH 1 (QUOTIANT)
2513  015134  001401                          BEQ     104$            ;IF NO.ERROR SKIP HLT
2514  015136  104000                          HLT                     ;CALL ERROR ROUTINE
2515  015140                        104$:
2516  015140  122777  000022  163106          CMPB    #22,@SR                 ;COMPARE SR WITH 22
2517  015146  001401                          BEQ     105$            ;IF NO.ERROR SKIP HLT
2518  015150  104000                          HLT                     ;CALL ERROR ROUTINE
2519  015152                        105$:
2520  015152  104400                          SCOPE                           ;TEST OF DIVIDE
2521  015154  012777  052524  163064          MOV     #52524,@MQ              ;LOAD MQ WITH 52524
2522  015162  012777  000000  163054          MOV     #0,@AC                  ;LOAD AC WITH 0
2523  015170  012777  052525  163044          MOV     #52525,@DIV             ;LOAD DIV WITH 52525 AND DIVIDE
2524  015176  022777  052524  163040          CMP     #52524,@AC              ;COMPARE AC WITH 52524 (REMAINDER)
2525  015204  001401                          BEQ     106$            ;IF NO.ERROR SKIP HLT
2526  015206  104000                          HLT                     ;CALL ERROR ROUTINE
2527  015210                        106$:
2528  015210  022777  000000  163030          CMP     #0,@MQ                  ;COMPARE MQ WITH 0 (QUOTIANT)
2529  015216  001401                          BEQ     107$            ;IF NO.ERROR SKIP HLT
2530  015220  104000                          HLT                     ;CALL ERROR ROUTINE
2531  015222                        107$:
2532  015222  122777  000010  163024          CMPB    #10,@SR                 ;COMPARE SR WITH 10
2533  015230  001401                          BEQ     108$            ;IF NO.ERROR SKIP HLT
2534  015232  104000                          HLT                     ;CALL ERROR ROUTINE
2535  015234                        108$:
2536  015234  104400                          SCOPE                           ;TEST OF DIVIDE
2537  015236  012777  000000  163002          MOV     #0,@MQ                  ;LOAD MQ WITH 0
2538  015244  012777  000000  162772          MOV     #0,@AC                  ;LOAD AC WITH 0
2539  015252  012777  125252  162762          MOV     #125252,@DIV            ;LOAD DIV WITH 125252 AND DIVIDE
2540  015260  022777  000000  162756          CMP     #0,@AC                  ;COMPARE AC WITH 0 (REMAINDER)
2541  015266  001401                          BEQ     109$            ;IF NO.ERROR SKIP HLT
2542  015270  104000                          HLT                     ;CALL ERROR ROUTINE
2543  015272                        109$:
2544  015272  022777  000000  162746          CMP     #0,@MQ                  ;COMPARE MQ WITH 0 (QUOTIANT)
2545  015300  001401                          BEQ     110$            ;IF NO.ERROR SKIP HLT
2546  015302  104000                          HLT                     ;CALL ERROR ROUTINE
2547  015304                        110$:
2548  015304  122777  000036  162742          CMPB    #36,@SR                 ;COMPARE SR WITH 36
2549  015312  001401                          BEQ     111$            ;IF NO.ERROR SKIP HLT
2550  015314  104000                          HLT                     ;CALL ERROR ROUTINE
2551  015316                        111$:
2552  015316  104400                          SCOPE                           ;TEST OF SUCCESIVE MULTIPLIES
2553  015320  012777  000001  162720          MOV     #1,@MQ
2554
2555  015326  012777  000002  162714          MOV     #2,@MUL
2556  015334  012777  000002  162706          MOV     #2,@MUL
2557  015342  012777  000002  162700          MOV     #2,@MUL
2558  015350  012777  000002  162672          MOV     #2,@MUL
2559  015356  012777  000002  162664          MOV     #2,@MUL
2560  015364  012777  000002  162656          MOV     #2,@MUL
2561  015372  012777  000002  162650          MOV     #2,@MUL
2562  015400  012777  000002  162642          MOV     #2,@MUL
2563  015406  012777  000002  162634          MOV     #2,@MUL
2564  015414  012777  000002  162626          MOV     #2,@MUL
2565  015422  012777  000002  162620          MOV     #2,@MUL
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```
2566  015430  012777  000002  162612          MOV     #2,@MUL
2567  015436  012777  000002  162604          MOV     #2,@MUL
2568  015444  012777  000002  162576          MOV     #2,@MUL
2569
2570  015452  022777  040000  162566          CMP     #40000,@MQ
2571  015460  001401                          BEQ     112$            ;IF NO.ERROR SKIP HLT
2572  015462  104000                          HLT                     ;CALL ERROR ROUTINE
2573  015464                          112$:
2574  015464  005777  162554                  TST     @AC
2575  015470  001401                          BEQ     113$            ;IF NO.ERROR SKIP HLT
2576  015472  104000                          HLT                     ;CALL ERROR ROUTINE
2577  015474                          113$:
2578  015474  122777  000022  162552          CMPB    #22,@SR                 ;CHECK STATUS 22
2579  015502  001401                          BEQ     114$            ;IF NO.ERROR SKIP HLT
2580  015504  104000                          HLT                     ;CALL ERROR ROUTINE
2581  015506                          114$:
2582  015506  104400                          SCOPE                           ;TEST OF SUCCESIVE DIVIDES
2583  015510  012777  040000  162530          MOV     #40000,@MQ
2584
2585  015516  012777  000002  162516          MOV     #2,@DIV
2586  015524  012777  000002  162510          MOV     #2,@DIV
2587  015532  012777  000002  162502          MOV     #2,@DIV
2588  015540  012777  000002  162474          MOV     #2,@DIV
2589  015546  012777  000002  162466          MOV     #2,@DIV
2590  015554  012777  000002  162460          MOV     #2,@DIV
2591  015562  012777  000002  162452          MOV     #2,@DIV
2592  015570  012777  000002  162444          MOV     #2,@DIV
2593  015576  012777  000002  162436          MOV     #2,@DIV
2594  015604  012777  000002  162430          MOV     #2,@DIV
2595  015612  012777  000002  162422          MOV     #2,@DIV
2596  015620  012777  000002  162414          MOV     #2,@DIV
2597  015626  012777  000002  162406          MOV     #2,@DIV
2598  015634  012777  000002  162400          MOV     #2,@DIV
2599
2600  015642  005777  162376                  TST     @AC
2601  015646  001401                          BEQ     115$            ;IF NO.ERROR SKIP HLT
2602  015650  104000                          HLT                     ;CALL ERROR ROUTINE
2603  015652                          115$:
2604  015652  022777  000001  162366          CMP     #1,@MQ
2605  015660  001401                          BEQ     116$            ;IF NO.ERROR SKIP HLT
2606  015662  104000                          HLT                     ;CALL ERROR ROUTINE
2607  015664                          116$:
2608  015664  122777  000022  162362          CMPB    #22,@SR                 ;CHECK STATUS 22
2609  015672  001401                          BEQ     117$            ;IF NO.ERROR SKIP HLT
2610  015674  104000                          HLT                     ;CALL ERROR ROUTINE
2611  015676                          117$:
2612  015676  104400                          SCOPE                           ;TEST OR ALTERNATE MUL AND DIV
2613  015700  012777  052525  162340          MOV     #52525,@MQ
2614
2615  015706  012777  040000  162334          MOV     #40000,@MUL
2616  015714  012777  040000  162320          MOV     #40000,@DIV
2617  015722  012777  040000  162320          MOV     #40000,@MUL
2618  015730  012777  040000  162304          MOV     #40000,@DIV
2619  015736  012777  040000  162304          MOV     #40000,@MUL
2620  015744  012777  040000  162270          MOV     #40000,@DIV
2621  015752  012777  040000  162270          MOV     #40000,@MUL
```

```
2622  015760  012777  040000  162254          MOV     #40000,@DIV
2623  015766  012777  040000  162254          MOV     #40000,@MUL
2624  015774  012777  040000  162240          MOV     #40000,@DIV
2625
2626  016002  022777  052525  162236          CMP     #52525,@MQ
2627  016010  001401                          BEQ     118$            ;IF NO.ERROR SKIP HLT
2628  016012  104000                          HLT                     ;CALL ERROR ROUTINE
2629  016014                          118$:
2630  016014  005777  162224                  TST     @AC
2631  016020  001401                          BEQ     119$            ;IF NO.ERROR SKIP HLT
2632  016022  104000                          HLT                     ;CALL ERROR ROUTINE
2633  016024                          119$:
2634  016024  122777  000022  162222          CMPB    #22,@SR                 ;CHECK STATUS 22
2635  016032  001401                          BEQ     120$            ;IF NO.ERROR SKIP HLT
2636  016034  104000                          HLT                     ;CALL ERROR ROUTINE
2637  016036                          120$:
2638  016036  104400                          SCOPE                           ;TEST OF FAST PROCESSING OF DATA
2639  016040  016700  162202                  MOV     MQ,%0                   ;SET UP POINTER
2640  016044  012720  125252                  MOV     #125252,(0)+            ;LOAD MQ
2641  016050  012710  040000                  MOV     #40000,(0)              ;LOAD MUL
2642  016054  014001                          MOV     -(0),%1                 ;SAVE MQ
2643  016056  014002                          MOV     -(0),%2                 ;SAVE AC
2644  016060  005720                          TST     (0)+
2645  016062  020127  100000                  CMP     %1,#100000              ;CHECK MQ
2646  016066  001401                          BEQ     121$            ;IF NO.ERROR SKIP HLT
2647  016070  104000                          HLT                     ;CALL ERROR ROUTINE
2648  016072                          121$:
2649  016072  020227  165252                  CMP     %2,#165252              ;CHECK AC
2650  016076  001401                          BEQ     122$            ;IF NO.ERROR SKIP HLT
2651  016100  104000                          HLT                     ;CALL ERROR ROUTINE
2652  016102                          122$:
2653
2654  016102  104400                          SCOPE                           ;SAVE WITH DIVIDE
2655  016104  016700  162136                  MOV     MQ,%0
2656  016110  012710  000001                  MOV     #1,(0)                  ;LOAD MQ WITH 1
2657  016114  012740  025253                  MOV     #25253,-(0)             ;LOAD AC WITH 25253
2658  016120  012740  125252                  MOV     #125252,-(0)            ;DIVIDE
2659  016124  005720                          TST     (0)+
2660  016126  012001                          MOV     (0)+,%1                 ;SAVE THE AC IN R1
2661  016130  011002                          MOV     (0),%2                  ;SAVE THE MQ IN R2
2662  016132  020127  000001                  CMP     %1,#1                   ;TEST THE AC
2663  016136  001401                          BEQ     123$            ;IF NO.ERROR SKIP HLT
2664  016140  104000                          HLT                     ;CALL ERROR ROUTINE
2665  016142                          123$:
2666  016142  020227  100000                  CMP     %2,#100000              ;TEST THE MQ
2667  016146  001401                          BEQ     124$            ;IF NO.ERROR SKIP HLT
2668  016150  104000                          HLT                     ;CALL ERROR ROUTINE
2669  016152                          124$:
2670  016152  104400                          SCOPE
2671
```

```
                                .DEV:
                                ;;*****************************************************************
                                ;       AT THIS POINT MULT AND DIV ARE OK
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;       BELL ON PASS COMPLETE
                                ;;*****************************************************************

016154  004767  001242          64$:    JSR     %7,CKSWR                ;CHECK FOR CONT-G
016160  032777  002000  162006          BIT     #2000,@SWR
016166  001021                          BNE     TRTRAP
016170  012737  000207  177566          MOV     #207,@#177566
016176  105777  000502                  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
016202  100375                          BPL     64$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
016204  012705  020031                  MOV     #$EAE,%5                ;PRINT EAE OK
016210  004767  001710                  JSR     %7,TTOUT


                                ;;*****************************************************************
                                ;       END OF PASS CODE AND CHECK FOR AUTO MODE
                                ;;*****************************************************************


016214  013700  000042                  MOV     @#42,%0
016220  001404                          BEQ     DOAGN
016222  004710                  $ENDAD: JSR     %7,(%0)
016224  000240                          NOP
016226  000240                          NOP
016230  000240                          NOP
016232                          DOAGN:


                                ;;*****************************************************************
                                ;       ROUTINE TO CHECK FOR TRACE TRAP TO BE RUN WITH PROGRAM
                                ;;*****************************************************************
016232  004767  001164          TRTRAP: JSR     %7,CKSWR                ;CHECK FOR CONT-G
016236  032777  010000  161730          BIT     #10000,@SWR             ;SHOULD WE RUN WITH TRACE TRAP
016244  001417                          BEQ     YESTR                   ;YES
016246  005767  000104                  TST     YESTR1                  ;NO  HAVE WE RAN WITH TRACE TRAP ON
016252  001411                          BEQ     TRPA                    ;IF SO RESTORE PREVIOUS CONTENTS
016254  016767  000076  161532          MOV     YESTR1,14
016262  016767  000072  161526          MOV     YESTR2,16
016270  042767  000020  161500          BIC     #20,PSW                 ;CLEAR TRACE TRAP
016276  000167  162056          TRPA:   JMP     BEGIN                   ;START OF TEST WITH TRACE OFF
016302  000000                  TRPB:   0

                                ;       SAVE OLD CONTENTS, SET UP FOR TRACE TRAP
016304  016767  161504  000044  YESTR:  MOV     14,YESTR1               ;SAVE ODT PC
016312  016767  161500  000040          MOV     16,YESTR2               ;SAVE ODT STATUS
016320  012767  016362  161466          MOV     #YESRT,14               ;NEW TRAP VECTOR
016326  005067  161464                  CLR     16                      ;NEW CONDITION CODES
016332  005067  161440                  CLR     PSW
016336  005167  177740                  COM     TRPB
```

```
2728  016342  100403                        BMI     1$
2729  016344  052767  000020  161424        BIS     #20,PSW                 ;SET TRACE TRAP
2730  016352                          1$:
2731  016352  000167  162002                JMP     BEGIN                   ;START OF TEST WITH TRACE ON
2732
2733  016356  000000                  YESTR1: 0                               ;STORAGE FOR ODT PC
2734  016360  000000                  YESTR2: 0                               ;STORAG FOR ODT STATUS
2735  016362  000002                  YESRT:  RTI                             ;RETURN TO PROGRAM FROM TRAP
2736  016364  000000                          HALT                            ;RTI FAILED
2737                                  ;       ENTERED WITH SYSTEM TRAP CALL(HLT)
2738                                  ;       PRINT OUT THE ERROR PC AND STATUS REGISTER
2739  016366  004767  001030          PRINT:  JSR     %7,CKSWR                ;CHECK FOR CONT-G
2740  016372  032777  002000  161574        BIT     #2000,@SWR
2741  016400  001406                        BEQ     PRNT
2742  016402  012737  000007  177566        MOV     #7,@#177566
2743  016410  105777  000270          64$:  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
2744  016414  100375                        BPL     64$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
2745  016416  004767  001000          PRNT:   JSR     %7,CKSWR                ;CHECK FOR CONT-G
2746  016422  037727  161546  020000        BIT     @SWR,#20000             ;TEST FOR INHIBIT PRINT OUT
2747  016430  001401                        BEQ     1$
2748  016432  000002                        RTI
2749  016434  012667  000246          1$:   MOV     (6)+,SAVPC              ;PC OF FAILING ROUTINE
2750  016440  012667  000244                MOV     (6)+,SAVCC              ;CC OF ERROR CONDITION
2751  016444  024646                        CMP     -(6),-(6)               ;REPOSITION THE STACK
2752  016446  012777  000215  000226        MOV     #215,@TPB               ;CR
2753  016454  105777  000224          64$:  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
2754  016460  100375                        BPL     64$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
2755  016462  012777  000212  000212        MOV     #212,@TPB               ;LINE FEED
2756  016470  105777  000210          65$:  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
2757  016474  100375                        BPL     65$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
2758  016476  010267  000172                MOV     %2,SAVR2                ;SAVE R2
2759  016502  010367  000170                MOV     %3,SAVR3                ;SAVE R3
2760  016506  010467  000166                MOV     %4,SAVR4                ;SAVE R4
2761  016512  016702  000170                MOV     SAVPC,%2
2762  016516  004767  000174                JSR     %7,PRTAB                ;PRINT OCTAL NUMBER
2763  016522  012777  000240  000152        MOV     #240,@TPB
2764  016530  105777  000150          66$:  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
2765  016534  100375                        BPL     66$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
2766  016536  017702  161502                MOV     @AC,%2
2767  016542  004767  000150                JSR     %7,PRTAB                ;PRINT OCTAL NUMBER
2768  016546  012777  000240  000126        MOV     #240,@TPB
2769  016554  105777  000124          67$:  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
2770  016560  100375                        BPL     67$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
2771  016562  017702  161460                MOV     @MQ,%2
2772  016566  004767  000124                JSR     %7,PRTAB                ;PRINT OCTAL NUMBER
2773  016572  012777  000240  000102        MOV     #240,@TPB
2774  016600  105777  000100          68$:  TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
2775  016604  100375                        BPL     68$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
2776  016606  017702  161440                MOV     @SC,%2
2777  016612  004767  000100                JSR     %7,PRTAB                ;PRINT OCTAL NUMBER
2778  016616  016702  000052                MOV     SAVR2,%2                ;RESTORE REGISTERS
2779  016622  016703  000050                MOV     SAVR3,%3
2780  016626  016704  000046                MOV     SAVR4,%4
2781  016632  004767  000564                JSR     %7,CKSWR                ;CHECK FOR CONT-G
2782  016636  005777  161332                TST     @SWR                    ;CHECK SR FOR HALT SWITCH
2783  016642  100004                        BPL     3$
```

```
2784  016644  000000                          HALT                    ; HALT ON ERROR
2785                                                                  ;GET SWITCH AFTER HALT
2786  016646  004767  000550                  JSR     %7,CKSWP        ;CHECK FOR CONT-G
2787  016652  000407                          BR      2$              ;RETURN TO MAINLINE
2788  016654  022737  016222  000042  3$:     CMP     #$ENDAD,@#42    ;CHECK FOR AUTO MODE
2789  016662  001003                          BNE     2$              ;NO, CONTINUE
2790  016664  000000                          HALT
2791                                                                  ; GET SWITCH AFTER HALT
2792  016666  004767  000530                  JSR     %7,CKSWR        ;CHECK FOR CONT-G
2793  016672                          2$:
2794  016672  000002                          RTI                     ;RETURN TO MAINLINE
2795  016674  000000                  SAVR2:  0
2796  016676  000000                  SAVR3:  0
2797  016700  000000                  SAVR4:  0
2798  016702  177566                  TPB:    177566                  ;DATA
2799  016704  177564                  TPS:    177564                  ;STATUS
2800  016706  000000                  SAVPC:  0
2801  016710  000000                  SAVCC:  0
2802  016712  177560                  TKS:    177560
2803  016714  177562                  TKB:    177562
2804  016716  005067  000260          PRTAB:  CLR     BINCT
2805  016722  005067  000252                  CLR     WGTCT
2806  016726  012704  017206                  MOV     #LIST,%4        ;GET LIST ADDRESS
2807  016732  142777  000177  177744          BICB    #177,@TPS       ;CLR INT FLAG
2808  016740  012767  000005  000236          MOV     #5,ASCNT
2809  016746  012767  000007  000220          MOV     #7,SEVEN
2810  016754  012767  000001  000214          MOV     #1,DECML
2811  016762                          WAIT1:
2812  016762  105777  177716          64$:    TSTB    @TPS            ;IS TTY READY FOR NEXT CHARACTER?
2813  016766  100375                          BPL     64$             ;IF READY BIT (BIT 7)=0--NO, LOOP
2814  016770  005702                          TST     %2
2815  016772  100404                          BMI     MINUS           ;NEG SIGN PRINT 1
2816  016774  012777  000260  177700          MOV     #260,@TPB       ;POS SIGN PRINT 0
2817  017002  000403                          BR      START
2818  017004  012777  000261  177670  MINUS:  MOV     #261,@TPB
2819  017012  016703  000156          START:  MOV     SEVEN,%3        ;PUT MASK IN R3
2820  017016  010267  000150                  MOV     %2,TOODLE       ;GET READY TO DOODLE NUMBER IN TOODLE
2621  017022  005167  000144                  COM     TOODLE          ;COMPENSATES FOR COMPLEMENT DURING BIC
2822  017026  046703  000140                  BIC     TOODLE,%3               ;AND IN OCTAL CHARACTER
2823  017032  001410                          BEQ     WRTOC           ;ZERO, WRITE 0 IN LIST
2824  017034  066767  000136  000136  MKNUM:  ADD     DECML,WGTCT     ;COUNT UP TO
2825  017042  005267  000134                  INC     BINCT                   ;AND RECORD
2826  017046  026703  000126                  CMP     WGTCT,%3        ;SAME BINARY WEIGHT
2827  017052  001370                          BNE     MKNUM           ;KEEP COUNTN
2828  017054  062767  000260  000120  WRTOC:  ADD     #260,BINCT      ;ADD ASCII PREFIX
2829  017062  016724  000114                  MOV     BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
2830  017066  066767  000102  000102          ADD     SEVEN,DECML     ;EXPAND BINARY WEIGHT
2831  017074  005067  000100                  CLR     WGTCT
2832  017100  005067  000076                  CLR     BINCT
2833  017104  005367  000074                  DEC     ASCNT
2834  017110  001410                          BEQ     XLIST           ;5 CHAR IN LIST
2835  017112  012703  000003                  MOV     #3,%3           ;SET X3 FOR ADD LOOP
2836  017116  066767  000052  000050  MOADD:  ADD     SEVEN,SEVEN     ;MAKING SEVENTY BY SEVEN
2837  017124  005303                          DEC     %3
2838  017126  001373                          BNE     MOADD
2839  017130  000730                          BR      START           ;NX SEVEN SET GET NX OCTAL
```

```
2840  017132  012767  000005  000044  XLIST:  MOV     #5,ASCNT          ;SEND 5 CHAR TO TTY
2841  017140                          WAIT2:
2842  017140  105777  177540          64$:    TSTB    @TPS              ;IS TTY READY FOR NEXT CHARACTER?
2843  017144  100375                          BPL     64$               ;IF READY BIT (BIT 7)=0--NO, LOOP
2844  017146  014477  177530                  MOV     -(4),@TPB
2845  017152  005367  000026                  DEC     ASCNT
2846  017156  001401                          BEQ     HDFHM
2847  017160  000767                          BR      WAIT2
2848  017162                          HDFHM:
2849  017162  105777  177516          64$:    TSTB    @TPS              ;IS TTY READY FOR NEXT CHARACTER?
2850  017166  100375                          BPL     64$               ;IF READY BIT (BIT 7)=0--NO, LOOP
2851  017170  000207                          RTS     %7                ;HEAD FOR HOME
2852  017172  000000                  TOODLE: 0
2853  017174  000000                  SEVEN:  0
2854  017176  000000                  DECML:  0
2855  017200  000000                  WGTCT:  0
2856  017202  000000                  BINCT:  0
2857  017204  000000                  ASCNT:  0
2858  017206  000000                  LIST:   0
2859  017210  000000                          0
2860  017212  000000                          0
2861  017214  000000                          0
2862  017216  000000                          0
```

```
                                ;;*****************************************************************
                                ;       SCOPE LOOP
                                ;       ENTERED BY USER TRAP
                                ;;*****************************************************************

017220                          SCOPEA:
017220  004767  000176          JSR     %7,CKSWR                ;CHECK FOR CONT-G
017224  032777  040000  160742  BIT     #40000,@SWR
017232  001003                  BNE     SCOPEB                  ;SCOPE   , BIT IS A ONE
017234  011667  000076          MOV     @%6,RETURN              ;NO - SAVE %7 FOR NEXT TIME
017240  000002                  RTI                             ;RETURN IN SEQUENCE
017242  022606                  SCOPEB: CMP     (6)+,%6         ;REPOSITION THE STACK
017244  012667  160526          MOV     (6)+,PSW
017250  000177  000062          JMP     @RETURN                 ;SCOPE   RETURN

017254  004767  000142          SCOPEC: JSR     %7,CKSWR                ;CHECK FOR CONT-G
017260  032777  040000  160706  BIT     #40000,@SWR             ;TEST SR FOR SCOPE
                                                                ;SCOPE   OR/AND ITERATION LOOP FOR EACH TEST 400
017266  001365                  BNE     SCOPEB                  ;YES SCOPE
017270  004767  000126          JSR     %7,CKSWR                ;CHECK FOR CONT-G
017274  032777  004000  160672  BIT     #4000,@SWR              ;NO - TEST FOR ITERATION
017302  001007                  BNE     SCOPEG                  ;INHIBIT ITERATION
017304  026727  000024  004000  CMP     SCOPEF,#4000
017312  001403                  BEQ     SCOPEG                  ;EXIT - DONE
017314  005267  000014          INC     SCOPEF                  ;INCREMENT COUNT
017320  000750                  BR      SCOPEB                  ;LOOP SOME MORE
017322  005067  000006          SCOPEG: CLR     SCOPEF          ;CLEAR COUNT
017326  011667  000004          MOV     @%6,RETURN              ;SAVE SCOPE      RETURN POINTER
017332  000002                  RTI                             ;RETURN INLINE-NEXT TEST
017334  000000                  SCOPEF: 0                       ;COUNT LOCATION FOR ITERATION LOOP
017336  000360                  RETURN: BEGIN                   ;ADDRESS OF LAST TEST
017340      000                 EOMK:   .BYTE   0
                                        .EVEN
017342  000167  160632                  JMP     200
017346  000040                          .BLKB   40
017406  000000                  BUFF:   0                       ;FOR STACK POINTER 40 LOCATIONS
017410  000000                  CP:     0


                                ;;*****************************************************************
                                ;       CHECK SWITCH REGISTER ROUTINE. CHECKS FOR ↑G TO ALLOW CHANGING
                                ;       OF LOC.176.
                                ;       LOCATIONS USED:
                                ;;*****************************************************************


017412  000000                          TEMPST: .WORD   0
017414  000000                          COUNT:  .WORD   0
017416  000000                          RDSW:   .WORD   0
017420  000000                          TIB:    .WORD   0
```

```
 2915  017422                          CKSWR:
 2916  017422  022767  000176  160544          CMP     #SWREG,SWR      ;SOFTWARE SWITCH REGISTER PRESENT
 2917  017430  001131                          BNE     OUT             ;NO, GET OUT
 2918  017432  105777  177254                  TSTB    @TKS            ;YES,WAIT FOR
 2919  017436  100126                          BPL     OUT             ;READY, GET CHARACTER
 2920  017440  017767  177250  177752          MOV     @TKB,TIB        ;AND STRIP OFF
 2921  017446  042767  177600  177744          BIC     #177600,TIB     ;THE GARBAGE
 2922  017454  022767  000007  177736          CMP     #7,TIB          ;IS IT A <^G>
 2923  017462  001114                          BNE     OUT
 2924  017464  012705  017770                  MOV     #$CNTG,%5
 2925  017470  004767  000430                  JSR     %7,TTOUT
 2926  017474  012705  020002          CNTLU:  MOV     #$MSWR,%5
 2927  017500  004767  000420                  JSR     %7,TTOUT
 2928  017504  017702  160464                  MOV     @SWR,R2
 2929  017510  004767  177202                  JSR     %7,PRTAB
 2930  017514  012705  020012                  MOV     #$MNEW,%5
 2931  017520  004767  000400                  JSR     %7,TTOUT
 2932  017524  005067  177662          $READ:  CLR     TEMPST
 2933  017530  012767  000007  177656          MOV     #7,COUNT
 2934  017536  004767  000154          1$:     JSR     %7,TTIN         ;GO  READ A CHARACTER
 2935  017542  042767  177600  177650          BIC     #177600,TIB     ;STRIP OFF GARBAGE
 2936  017550  122767  000025  177642          CMPB    #25,TIB         ;IS IT A ^U?
 2937  017556  001001                          BNE     2$              ;BRANCH IF NOT
 2938  017560  000745                  3$:     BR      CNTLU           ;START OVER
 2939  017562  122767  000015  177630  2$:     CMPB    #15,TIB         ;IS IT A <CR>?
 2940  017570  001011                          BNE     4$              ;BRANCH IF NOT
 2941  017572  012705  017776                  MOV     #$CRLF,%5
 2942  017576  004767  000322                  JSR     %7,TTOUT
 2943  017602  022767  000007  177604          CMP     #7,COUNT        ;WAS IT FIRST CHARACTER
 2944  017610  001036                          BNE     7$              ;CHANGE SWR IF NOT FIRST ONE
 2945  017612  000440                  8$:     BR      OUT             ;GET OUT
 2946  017614  122767  000060  177576  4$:     CMPB    #60,TIB
 2947  017622  003004                          BGT     5$
 2948  017624  122767  000067  177566          CMPB    #67,TIB
 2949  017632  002005                          BGE     6$
 2950  017634  012705  020023          5$:     MOV     #$QUEST,%5
 2951  017640  004767  000260                  JSR     %7,TTOUT
 2952  017644  000745                          BR      3$              ;START OVER IF NOT LEGAL CHARACTER
 2953  017646  006367  177540          6$:     ASL     TEMPST
 2954  017652  006367  177534                  ASL     TEMPST
 2955  017656  006367  177530                  ASL     TEMPST
 2956  017662  142767  000060  177530          BICB    #60,TIB         ;GET NITTY-GRITTY
 2957  017670  156767  177524  177514          BISB    TIB,TEMPST
 2958  017676  005367  177512                  DEC     COUNT           ;ONLY WANT 6   DIGITS
 2959  017702  001754                          BEQ     5$
 2960  017704  000714                          BR      1$
 2961  017706  016777  177500  160260  7$:     MOV     TEMPST,@SWR     ;CHANGE SWITCH REGISTER CONTENTS
 2962  017714  000207                  OUT:    RTS     %7              ;RETURN TO PROGRAM
```

```
                                ;;*****************************************************************
                                ;       TTY READ SUBROUTINE**********
                                ;;*****************************************************************

017716                          TTIN:
017716  005077  176770                  CLR     @TKS
017722  005077  176766                  CLR     @TKB
017726  005067  177466                  CLR     TIB
017732  005277  176754                  INC     @TKS
017736  105777  176750          TTIN1:  TSTB    @TKS
017742  100375                          BPL     TTIN1
017744  017767  176744  177446        MOV     @TKB,TIB
017752                          TTIN2:
017752  105777  176726          64$:    TSTB    @TPS                    ;IS TTY READY FOR NEXT CHARACTER?
017756  100375                          BPL     64$                     ;IF READY BIT (BIT 7)=0--NO, LOOP
017760  116777  177434  176714        MOVB    TIB,@TPB

017766  000207                        RTS     %7
017770  057137  020107  000046  $CNTG:  .ASCIZ  '←↑G &'
017776  020137  000046        $CRLF:  .ASCIZ  '← &'
020002  051537  051127  020075  $MSWR:  .ASCIZ  '←SWR= &'
020010  000046
020012  020040  042516  036527  $MNEW:  .ASCIZ  '  NEW= &'
020020  023040  000
020023  137     020077  023137  $QUEST: .ASCIZ  '←? ←&'
020030  000
020031  137     040505  020105  $EAE:   .ASCIZ  '←EAE OK  ← &'
020036  045517  020040  020137
020044  000046
020046  020137  040515  047111  $MAIN:  .ASCIZ  '← MAINDEC-11-DZKEB-B &'
020054  042504  026503  030461
020062  042055  045532  041105
020070  041055  023040  000
020075  137     045440  030505  $HEAD:  .ASCIZ  '← KE11 LOGIC TEST &'
020102  020061  047514  044507
020110  020103  042524  052123
020116  023040  000
        020122                          .EVEN

020122  000000                  OFL:    0                               ;FIRST CHAR FLAG
```

```
                                ;;*****************************************************************
                                ;;      TTY ASCII OUTPUT ROUTINE
                                ;;*****************************************************************


020124                          TTOUT:
020124  105715                         TSTB    (5)             ;CHECK FOR NULL CHARACTER
020126  001403                         BEQ     1$              ;IF NOT, TYPE THE CHARACTER
020130  122715  000046                 CMPB    #'&,(5)         ;CHECK FOR TERMINATOR
020134  001005                         BNE     .EMPTY
020136  042777  000100  176540  1$:    BIC     #100,@TPS
020144  005005                         CLR     %5              ;CLEAR POINTER TO CHARACTER
020146  000207                         RTS     %7              ;RETURN
020150  122715  000137          .EMPTY: CMPB    #'^,(5)         ;CRLF CHAR?
020154  001411                         BEQ     .RET
020156  122715  000041                 CMPB    #'!,(5)         ;CHECK FOR RETURN TERMINATOR
020162  001414                         BEQ     .REST
020164                          1$:
020164  105777  176514          64$:    TSTB    @TPS            ;IS TTY READY FOR NEXT CHARACTER?
020170  100375                         BPL     64$             ;IF READY BIT (BIT 7)=0--NO, LOOP
020172  112577  176504          .1:     MOVB    (5)+,@TPB       ;TYPE CHARACTER
020176  000752                         BR      TTOUT
020200  005205                  .RET:   INC     %5
020202  010567  000020                 MOV     %5,.SAV         ;SET UP NEW POINTER
020206  012705  020222                 MOV     #.RETR,%5
020212  000767                         BR      .1
020214  016705  000006          .REST:  MOV     .SAV,%5
020220  000741                         BR      TTOUT

020222     015     012     041  .RETR:  .BYTE   15,12,'!
020226                          .EVEN
020226  000000                  .SAV:   0
000001                          .END
```

```
AC      000244   71# 102* 150* 151  162* 163  181* 182  188  194  204  214  220
                225  261* 287  304* 316* 328* 341* 353* 366* 380* 392* 404* 417*
                430* 443* 455* 468* 481* 494* 510* 512  521* 523  534* 536  547*
                549  558* 560  571* 573  583* 585  596* 598  607* 609  620* 622
                633* 635  645* 647  656* 658  669* 671  682* 684  695* 697  712*
                905* 907  917* 923  930* 936  943* 949  954* 960  967* 973  980*
                986  993* 999  1005* 1011 1017* 1023 1030* 1036 1043* 1049 1055* 1061
               1068* 1074 1080* 1086 1097* 1099 1116* 1118 1133* 1135 1149* 1151 1168*
               1170  1186* 1188 1203* 1205 1221* 1223 1239* 1241 1256* 1258 1275* 1277
               1293* 1295  1309* 1311 1325* 1327 1341* 1343 1357* 1359 1375* 1377 1393*
               1395  1409* 1411 1431* 1433 1449* 1451 1465* 1467 1484* 1486 1503* 1505
               1520* 1522  1537* 1539 1555* 1557 1571* 1573 1589* 1591 1607* 1609 1623*
               1625  1641* 1643 1659* 1661 1675* 1677 1693* 1695 1711* 1713 1740* 1742
               1759* 1761  1777* 1779 1793* 1795 1812* 1814 1834* 1836 1850* 1852 1867*
               1869  1884* 1886 1900* 1902 1917* 1919 1933* 1935 1950* 1952 1974* 1976
               1993* 1995  2010* 2012 2030* 2032 2049* 2051 2067* 2069 2087* 2089 2133
               2150  2168  2183 2201 2218 2241 2254* 2260 2272* 2274 2291* 2293 2310*
               2312  2326* 2328 2345* 2347 2364* 2366 2380* 2382 2399* 2401 2418* 2420
               2434* 2436  2453* 2455 2471* 2473 2487* 2489 2506* 2508 2522* 2524 2538*
               2540  2574  2600 2630 2766
ACMQ    007416 1426#
AC1L    002444  507#
AC10L   004530  902#
ASCNT   017204 2808* 2833* 2840* 2845* 2857#
ASH     000262   78# 1741* 1760* 1778* 1794* 1813* 1835* 1851* 1868* 1885* 1901* 1918* 1934*
               1951*
ASL     011532 1831#
ASR     011140 1735#
BEGIN   000360   97   99  101# 2718 2731 2893
BINCT   017202 2804* 2825* 2828* 2829 2832* 2856#
BUFF    017406   61 2898#
CKSWR   017422  250 2120  2680 2710 2739 2745 2781 2786 2792 2869 2878 2882 2915#
CNTLU   017474  100 2926# 2938
COUNT   017414 2911# 2933* 2943 2958*
CP      017410  173* 174*  176  177  181  182 2899#
CP1     000636  174# 183
DECML   017176 2810* 2824  2830* 2854#
DIV     000242   70# 2236* 2255* 2273* 2292* 2311* 2327* 2346* 2365* 2381* 2400* 2419* 2435*
               2454* 2472* 2488* 2507* 2523* 2539* 2585* 2586* 2587* 2588* 2589* 2590* 2591*
               2592* 2593* 2594* 2595* 2596* 2597* 2598* 2616* 2618* 2620* 2622* 2624*
DIVIDE  013522 2233#
DOAGN   016232 2698  2703#
EOMK    017340 2894#
HDFHM   017162 2846  2848#
HLT   = 104000   52# 113  122  130  135  142  147  153  158  165  169  179  184
                190  196  202  206  212  216  222  227  231  237  243  269  273
                289  293  308  312  320  324  332  336  345  349  357  361  371
                375  384  388  396  400  408  412  421  425  434  438  447  451
                459  463  472  476  485  489  498  502  514  518  525  529  538
                542  551  555  562  566  575  579  587  591  600  604  611  615
                624  628  637  641  649  653  660  664  673  677  686  690  699
                703  716  720  729  733  741  745  753  757  764  768  775  779
                787  791  799  803  810  814  822  826  834  838  846  850  857
                861  869  873  881  885  893  897  909  913  921  925  934  938
                947  951  958  962  971  975  984  988  997 1001 1009 1013 1021
               1025 1034 1038 1047 1051 1059 1063 1072 1076 1084 1088 1101 1105
```

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                    1109    1120    1124    1128    1137    1141    1145    1153    1157    1161    1172    1176    1180
                    1190    1194    1198    1207    1211    1215    1225    1229    1233    1243    1247    1251    1260
                    1264    1268    1279    1283    1287    1297    1301    1305    1313    1317    1321    1329    1333
                    1337    1345    1349    1353    1361    1365    1369    1379    1383    1387    1397    1401    1405
                    1413    1417    1421    1435    1439    1443    1453    1457    1461    1469    1473    1477    1488
                    1492    1496    1507    1511    1515    1524    1528    1532    1541    1545    1549    1559    1563
                    1567    1575    1579    1583    1593    1597    1601    1611    1615    1619    1627    1631    1635
                    1645    1649    1653    1663    1667    1671    1679    1683    1687    1697    1701    1705    1715
                    1719    1723    1744    1748    1752    1763    1767    1771    1781    1785    1789    1797    1801
                    1805    1816    1820    1824    1838    1842    1846    1854    1858    1862    1871    1875    1879
                    1888    1892    1896    1904    1908    1912    1921    1925    1929    1937    1941    1945    1954
                    1958    1962    1978    1982    1987    1997    2001    2006    2014    2018    2023    2034    2038
                    2043    2053    2057    2062    2071    2075    2080    2091    2095    2100    2135    2139    2143
                    2152    2156    2160    2170    2174    2178    2185    2189    2193    2203    2207    2211    2220
                    2224    2228    2239    2245    2249    2258    2264    2268    2276    2280    2284    2295    2299
                    2303    2314    2318    2322    2330    2334    2338    2349    2353    2357    2368    2372    2376
                    2384    2388    2392    2403    2407    2411    2422    2426    2430    2438    2442    2446    2457
                    2461    2465    2475    2479    2483    2491    2495    2499    2510    2514    2518    2526    2530
                    2534    2542    2546    2550    2572    2576    2580    2602    2606    2610    2628    2632    2636
                    2647    2651    2664    2668
LIST        017206  2806    2858#
LOOP        001172   264#    276
LOOP1       001242   284#    296
LSH         000260    77#    266*    286*    305*    317*    329*    342*    354*    367*    381*    393*    405*    418
                     431*    444*    456*    469*    482*    495*    511*    522*    535*    548*    559*    572*    584*
                     597*    608*    621*    634*    646*    657*    670*    683*    696*    713*    726*    738*    750*
                     761*    772*    784*    796*    807*    819*    831*    843*    854*    866*    878*    890*    906*
                     918*    931*    944*    955*    968*    981*    994*   1006*   1018*   1031*   1044*   1056*   1069*
                    1081*   1098*   1117*   1134*   1150*   1169*   1187*   1204*   1222*   1240*   1257*   1276*   1294*
                    1310*   1326*   1342*   1358*   1376*   1394*   1410*   1432*   1450*   1466*   1485*   1504*   1521*
                    1538*   1556*   1572*   1590*   1608*   1624*   1642*   1660*   1676*   1694*   1712*
MINUS       017004  2815    2818#
MKNUM       017034  2824#   2827
MOADD       017116  2836#   2838
MQ          000246    72#    103*    127*    128     139*    140     176*    177     187*    193*    199*    200     209*
                     210     219*    224*    229     262*    267     303*    306     315*    318     327*    330     340*
                     343     352*    355     365*    369     379*    382     391*    394     403*    406     416*    419
                     429*    432     442*    445     454*    457     467*    470     480*    483     493*    496     509*
                     711*    714     725*    731     737*    743     749*    755     760*    766     771*    777     783*
                     789     795*    801     806*    812     818*    824     830*    836     842*    848     853*    859
                     865*    871     877*    883     889*    895     904*   1096*   1103    1115*   1122    1132*   1139
                    1148*   1155    1167*   1174    1185*   1192    1202*   1209    1220*   1227    1238*   1245    1255*
                    1262    1274*   1281    1292*   1299    1308*   1315    1324*   1331    1340*   1347    1356*   1363
                    1374*   1381    1392*   1399    1408*   1415    1430*   1437    1448*   1455    1464*   1471    1483*
                    1490    1502*   1509    1519*   1526    1536*   1543    1554*   1561    1570*   1577    1588*   1595
                    1606*   1613    1622*   1629    1640*   1647    1658*   1665    1674*   1681    1692*   1699    1710*
                    1717    1739*   1746    1758*   1765    1776*   1783    1792*   1799    1811*   1818    1833*   1840
                    1849*   1856    1866*   1873    1883*   1890    1899*   1906    1916*   1923    1932*   1939    1949*
                    1956    1973*   1980    1992*   1999    2009*   2016    2029*   2036    2048*   2055    2066*   2073
                    2086*   2093    2131*   2137    2148*   2154    2166*   2172    2181*   2187    2199*   2205    2216*
                    2222    2235*   2253*   2271*   2278    2290*   2297    2309*   2316    2325*   2332    2344*   2351
                    2363*   2370    2379*   2386    2398*   2405    2417*   2424    2433*   2440    2452*   2459    2470*
                    2477    2486*   2493    2505*   2512    2521*   2528    2537*   2544    2553*   2570    2583*   2604
                    2613*   2626    2639    2655    2771
MQAC        005530  1093#
MQOL        001154   252     259#
```

```
MQ1R    001304   301#
MQ10R   003506   709#
MUL     000250    73#  2132*  2149*  2167*  2182*  2200*  2217*  2555*  2556*  2557*  2558*  2559*  2560*
                2561*  2562*  2563*  2564*  2565*  2566*  2567*  2568*  2615*  2617*  2619*  2621*  2623*
NOP   = 000240    54#
NOR     000256    76#   235    241   1975*  1994*  2011*  2031*  2050*  2068*  2088*
NORMAL  012352  1970#
OFL     020122  3007#
OUT     017714  2917   2919   2923   2945   2962#
OUTPC   000704   175    185#
PRINT   016366    37   2739#
PRNT    016416  2741   2745#
PRTAB   016716  2762   2767   2772   2777   2804#  2929
PSW   = 177776    53#  2717*  2726*  2729*  2875*
RDSW    017416  2912#
REGWRI  000400   108#
RETURN  017336   101*  2872*  2876   2890*  2893#
SAVCC   016710  2750*  2801#
SAVPC   016706  2749*  2761   2800#
SAVR2   016674  2758*  2778   2795#
SAVR3   016676  2759*  2779   2796#
SAVR4   016700  2760*  2780   2797#
SC      000252    74#   110*   111    117*   118    124*   234*   240*   265*   285*  1984   2003   2020
                2040  2059   2077   2097   2776
SCOPE = 104400    55#   109    116    126    138    149    161    172    186    260    282    302    314
                 326   339    351    364    378    390    402    415    428    441    453    466    479
                 492   508    520    533    546    557    570    582    595    606    619    632    644
                 655   668    681    694    710    724    736    748    759    770    782    794    805
                 817   829    841    852    864    876    888    903    916    929    942    953    966
                 979   992   1004   1016   1029   1042   1054   1067   1079   1095   1114   1131   1147
                1166  1184   1201   1219   1237   1254   1273   1291   1307   1323   1339   1355   1373
                1391  1407   1429   1447   1463   1482   1501   1518   1535   1553   1569   1587   1605
                1621  1639   1657   1673   1691   1709   1738   1757   1775   1791   1810   1832   1848
                1865  1882   1898   1915   1931   1948   1972   1991   2008   2028   2047   2065   2085
                2130  2147   2165   2180   2198   2215   2234   2252   2270   2289   2308   2324   2343
                2362  2378   2397   2416   2432   2451   2469   2485   2504   2520   2536   2552   2582
                2612  2638   2654   2670
SCOPEA  017220  2868#
SCOPEB  017242  2871   2874#  2881   2888
SCOPEC  017254    40   2878#
SCOPEF  017334   185*  2885   2887*  2889*  2892#
SCOPEG  017322  2884   2886   2889#
SEVEN   017174  2809*  2819   2830   2836*  2853#
SR      000254    75#   133    145    156    167    271    291    310    322    334    347    359    373
                 386   398    410    423    436    449    461    474    487    500    516    527    540
                 553   564    577    589    602    613    626    639    651    662    675    688    701
                 718   727    739    751    762    773    785    797    808    820    832    844    855
                 867   879    891    911    919    932    945    956    969    982    995   1007   1019
                1032  1045   1057   1070   1082   1107   1126   1143   1159   1178   1196   1213   1231
                1249  1266   1285   1303   1319   1335   1351   1367   1385   1403   1419   1441   1459
                1475  1494   1513   1530   1547   1565   1581   1599   1617   1633   1651   1669   1685
                1703  1721   1750   1769   1787   1803   1822   1844   1860   1877   1894   1910   1927
                1943  1960   2141   2158   2176   2191   2209   2226   2237*  2243*  2247*  2256*  2262*
                2266*  2282   2301   2320   2336   2355   2374   2390   2409   2428   2444   2463   2481
                2497   2516   2532   2548   2578   2608   2634
START   017012  2817   2819#  2839
```

```
SUSWR   000264          69      86#
SWR     000174          57#     89      93*     96      251     2121    2681    2711    2740    2746    2782    2870    2879
                        2883    2916    2928    2961*
SWREG   000176          59#     93      96      2916
TEMPST  017412          2910#   2932*   2953*   2954*   2955*   2957*   2961
TIB     017420          2913#   2920*   2921*   2922    2935*   2936    2939    2946    2948    2956*   2957    2975*   2979*
                        2983
TKB     016714          2803#   2920    2974*   2979
TKS     016712          2802#   2918    2973*   2976*   2977
TOODLE  017172          2820*   2821*   2822    2852#
TPB     016702          2752*   2755*   2763*   2768*   2773*   2798#   2816*   2818*   2844*   2983*   3029*
TPS     016704          2684    2743    2753    2756    2764    2769    2774    2799#   2807*   2812    2842    2849    2981
                        3019*   3027
TRPA    016276          2714    2718#
TRPB    016302          2719#   2727*
TRTRAP  016232          2682    2710#
TTIN    017716          2934    2972#
TTIN1   017736          2977#   2978
TTIN2   017752          2980#
TTOUT   020124          66      68      2687    2925    2927    2931    2942    2951    3014#   3030    3036
WAIT1   016762          2811#
WAIT2   017140          2841#   2847
WGTCT   017200          2805*   2824*   2826    2831*   2855#
WRTOC   017054          2823    2838#
XLIST   017132          2834    2840#
YESRT   016362          2724    2735#
YESTR   016304          2712    2722#
YESTR1  016356          2713    2715    2722*   2733#
YESTR2  016360          2716    2723*   2734#
$CNTG   017770          2924    2986#
$CRLF   017776          2941    2987#
$EAE    020031          2686    2994#
$ENDAD  016222          47      62      98      2699#   2788
$HEAD   020075          65      3001#
$MAIN   020046          67      2997#
$MNEW   020012          2930    2990#
$MSWR   020002          2926    2988#
$QUEST  020023          2950    2992#
$READ   017524          2932#
.       =  020230       35#     36#     39#     42#     46#     48#     50#     56#     58#     60#     2895#   2897#   3005#
                        3039#
.CONT   013574          2244    2246    2248    2251#
.CONT1  013656          2263    2265    2267    2269#
.DEV    016154          2123    2672#
.DIV    013112          253     2122    2127#
.EMPTY  020150          3018    3022#
.HLT    013572          2249#
.HLT1   013654          2268#
.MIN    013564          2242    2247#
.MIN1   013646          2261    2266#
.REST   020214          3025    3035#
.RET    020200          3023    3031#
.RETR   020222          3033    3038#
.SAV    020226          3032*   3035    3040#
.1      020172          3029#   3034
```

```
B.4          2#   112   121   129   134   141   146   152   157   164   168   178   189   195   201
           205    211   215   221   226   230   236   242   268   272   288   292   307   311   319
           323    331   335   344   348   356   360   370   374   383   387   395   399   407   411
           420    424   433   437   446   450   458   462   471   475   484   488   497   501   513
           517    524   528   537   541   550   554   561   565   574   578   586   590   599   603
           610    614   623   627   636   640   648   652   659   663   672   676   685   689   698
           702    715   719   728   732   740   744   752   756   763   767   774   778   786   790
           798    802   809   813   821   825   833   837   845   849   856   860   868   872   880
           884    892   896   908   912   920   924   933   937   946   950   957   961   970   974
           983    987   996  1000  1008  1012  1020  1024  1033  1037  1046  1050  1058  1062  1071
          1075   1083  1087  1100  1104  1108  1119  1123  1127  1136  1140  1144  1152  1156  1160
          1171   1175  1179  1189  1193  1197  1206  1210  1214  1224  1228  1232  1242  1246  1250
          1259   1263  1267  1278  1282  1286  1296  1300  1304  1312  1316  1320  1328  1332  1336
          1344   1348  1352  1360  1364  1368  1378  1382  1386  1396  1400  1404  1412  1416  1420
          1434   1438  1442  1452  1456  1460  1468  1472  1476  1487  1491  1495  1506  1510  1514
          1523   1527  1531  1540  1544  1548  1558  1562  1566  1574  1578  1582  1592  1596  1600
          1610   1614  1618  1626  1630  1634  1644  1648  1652  1662  1666  1670  1678  1682  1686
          1696   1700  1704  1714  1718  1722  1743  1747  1751  1762  1766  1770  1780  1784  1788
          1796   1800  1804  1815  1819  1823  1837  1841  1845  1853  1857  1861  1870  1874  1878
          1887   1891  1895  1903  1907  1911  1920  1924  1928  1936  1940  1944  1953  1957  1961
          1977   1981  1986  1996  2000  2005  2013  2017  2022  2033  2037  2042  2052  2056  2061
          2070   2074  2079  2090  2094  2099  2134  2138  2142  2151  2155  2159  2169  2173  2177
          2184   2188  2192  2202  2206  2210  2219  2223  2227  2275  2279  2283  2294  2298  2302
          2313   2317  2321  2329  2333  2337  2348  2352  2356  2367  2371  2375  2383  2387  2391
          2402   2406  2410  2421  2425  2429  2437  2441  2445  2456  2460  2464  2474  2478  2482
          2490   2494  2498  2509  2513  2517  2525  2529  2533  2541  2545  2549  2571  2575  2579
          2601   2605  2609  2627  2631  2635  2646  2650  2663  2667
STARS        2#     3    17    32    82    84   105   107   246   249   255   258   279   281   298
           300    504   506   705   707   899   901  1090  1092  1423  1425  1726  1728  1730  1734
          1828   1830  1964  1966  1967  1969  2105  2107  2114  2117  2124  2126  2230  2232  2673
          2675   2676  2678  2691  2693  2707  2709  2863  2866  2903  2907  2966  2968  3009  3011
WATTPS       2#  2684  2743  2753  2756  2764  2769  2774  2812  2842  2849  2981  3027
.HEADE       2#     5

. ABS.   020230      000

 ERRORS DETECTED:  0

DZKEBB.BIN,DZKEBB.LST/CRF/SOL/NL:TOC=DZKEBB.P11
RUN-TIME:  3  7  .7 SECONDS
RUN-TIME RATIO:  49/11=4.1
CORE USED:  7K  (13 PAGES)
```