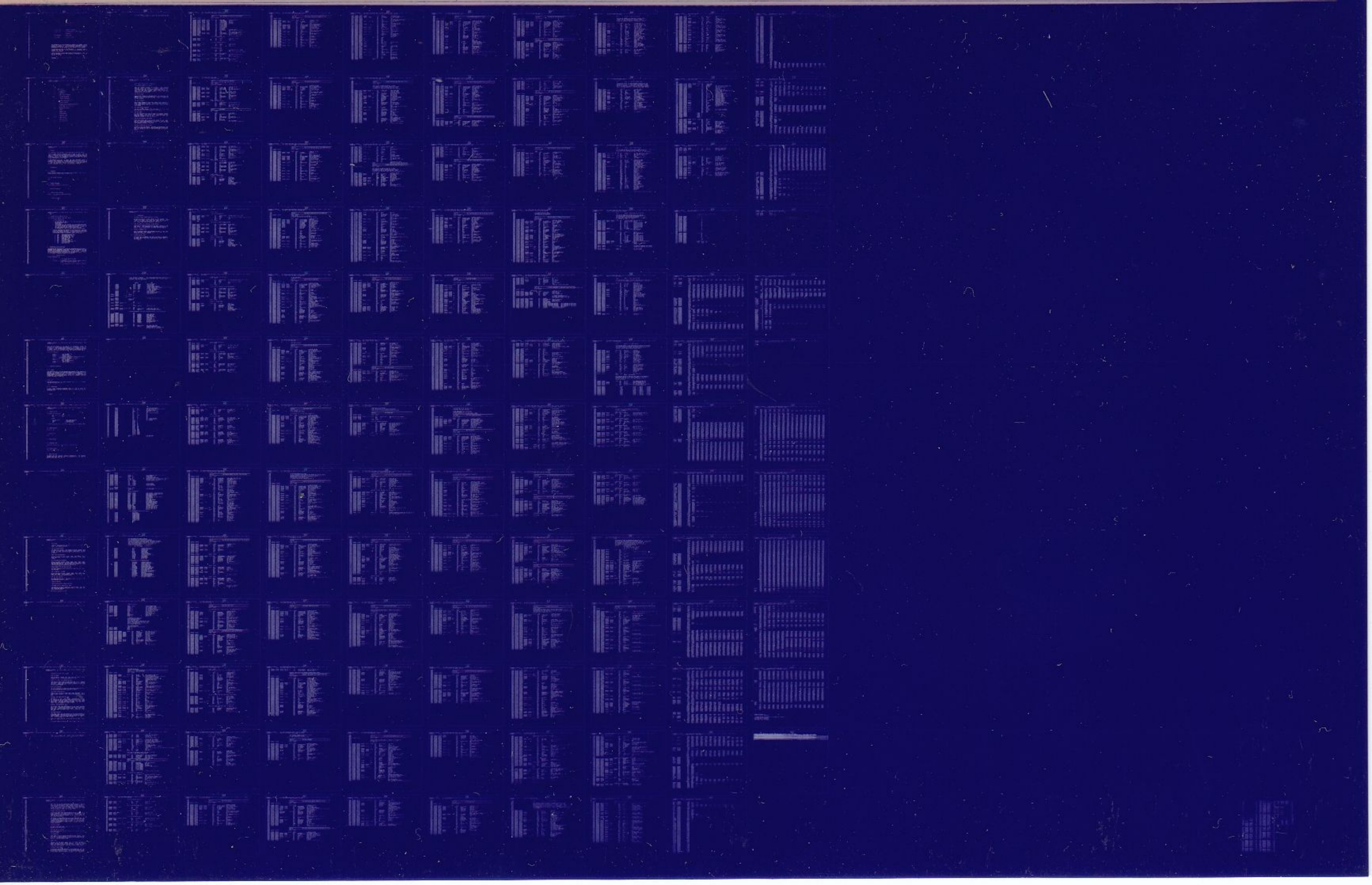
RH11-RS03

BASIC FUNCT'AL DIAL
MD-11-DZRSB-E

EP-DZRSB-E-DL-A

FICHE 1 OF 1

NOV 1976
digital
MADE IN USA



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                        .REM    %
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZRSB-E-D
PRODUCT NAME:	RH11-RS03-RS03/LA-RS04 BASIC FUNCTION DIAGNOSTIC
DATE CREATED:	AUGUST 1976
MAINTAINER:	DIAGNOSTIC GROUP

CONTENTS

DESCRIPTION

1. ABSTRACT

THIS DIAGNOSTIC WAS DESIGNED TO TEST RS03,RS03/LA AND RS04 DRIVES.

THIS IS A BASIC FUNCTION DIAGNOSTIC WHICH IS USED TO VERIFY THAT THE (RH11) CONTROLLER AND THE (RS03,RS03/LA OR RS04) DISKS ARE OPERATING CORRECTLY. THIS IS NOT A RELIABILITY DIAGNOSTIC AND THEREFORE SHOULD NOT BE USED AS ONE. THIS PROGRAM CAN TEST UP TO 8 DRIVES. THE DRIVES CAN BE INTERMIXED AND IN ANY ORDER.

IF THE OPERATOR WOULD LIKE TO CHECK THE DISK REGISTERS PRIOR TO ENTERING THIS DIAGNOSTIC, THERE ARE SOME ROUTINES IN THE BACK OF THE DIAGNOSTIC WHICH CAN BE USED. THESE ROUTINES WILL ALLOW THE OPERATOR TO LOAD THE REGISTERS THROUGH THE SWITCHES. PLEASE REFERENCE THE STARTING ADDRESSES THAT WILL TEST THE REGISTERS YOU DESIRE.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP11 STANDARD COMPUTER WITH A MINIMUM OK 8K OF MEMORY, AND AN RH11 CONTROLLER WITH A RS03, RS03/LA OR RS04 DISK.

2.3 PRELIMINARY PROGRAMS

NONE

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR ABS TAPES.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5.1.1 (ALL DOWN FOR WORST CASE TESTING)

4.2 STARTING ADDRESS

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY USING ABS LOADER.

1. STARTING ADDRESS 200.

   A. SET SWITCHES (SEE SEC 5.1.1) ALL DOWN FOR WORST CASE. IF SWITCHLESS CPU, SIMPLY
   B. PRESS START.
   C. THE PROGRAM WILL LOOP AND BELL WILL RING ONCE EVERY PASS
   D. THE DISPLAY ON THE 11/45 WILL SHOW THE ITERATION COUNT IN THE LEFT BYTE AND TEST NUMBER IN THE RIGHT. TO USE, SET THE DATA DISPLAY SWITCH TO THE DISPLAY POSITION.
   E. THE PROGRAM WILL TEST ALL RS03, RS03/LA AND RS04 DISKS.

2. STARTING ADDRESSES FOR TESTING THE RH11-RS03/LA/04 REGISTERS USING THE SWITCH REGISTER. ON SWITCH-LESS MACHINES THESE ROUTINES ARE USEFULL FOR SCOPING. SIMPLY STRIKE ↑G ANYTIME AFTER PRESSING START TO ENTER OR CHANGE VALUE DESIRED.

A.	250	WORD COUNT REGISTER TEST
B.	254	BUS ADDRESS REG. TEST
C.	260	DISK ADDRESS REG. TEST
D.	264	DRIVE STATUS REG. TEST
E.	270	ERROR REG. TEST
F.	274	LOOK AHEAD REG. TEST
G.	300	RSCS2 REG. TEST
H.	304	ATTENTION SUMMARY REG. TEST
I.	310	MAINTENANCE REG. TEST
J.	314	RSCS1 REG TEST

5. OPERATIONAL SWITCH SETTINGS

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC.176) IS DEFAULTED TO. IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(I.E.) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

1.	‹CR›	IF NO CHANGES ARE TO BE MADE.
2.	6 DIGITS 0-7	TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE; LAST DIGIT FOLLOWED BY ‹CR›.
3.	↑U	TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED

205 KEYING IN SWREG VALUE.

DESCRIPTION

BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ↑G (CNTL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER APPLICABLE AREAS.

SWITCH SETTINGS ARE:

```
SW<15> = 1 ..... HALT ON ERROR
SW<14> = 1 ..... LOOP ON TEST
SW<13> = 1 ..... INHIBIT TYPEOUTS
SW<12> = 1 ..... INHIBIT OBUFSV FROM CHANGING WHEN LOOKING
                 FOR MEMORY ON -B- PORT
SW<11> = 1 ..... INHIBIT ITERATIONS OF SUBTEST
SW<10> = 1 ..... BELL ON ERROR
         0 ..... BELL ON PASS COMPLETE
SW<09> = 1 ..... LOOP ON ERROR
SW<08> = 1 ..... LOOP ON TEST IN SW<7:0>
```

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

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

5.2.2 HLT

THIS ROUTINE PRINTS OUT AN ERROR MESSAGE (SEE 6.1). TO INHIBIT TYPEOUTS, PUT SW<13> ON A 1.

5.2.3 TRAPCATCHER

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

6. ERRORS

6.1 ERROR PRINTOUT

THE FORMAT IS AS FOLLOWS:

```
ADR   CS1 = ----- CS2 = ----- ER = -----
GOOD      = ----- BAD = -----
```

WHERE:

```
CS1,CS2,ER ETC.     = RS11 DISK REGISTERS.
GOOD                = EXPECTED DATA.
BAD                 = DATA RECEIVED.
```

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

6.2 ERROR RECOVERY

RESTART AT 200

7. RESTRICTIONS

NONE

8. MISCELLANEOUS

8.1 EXECUTION TIME

A BELL WILL RING WITHIN 1 MINUTE WITH ALL SWITCHES DOWN.

8.2 STACK POINTER

STACK IS INITALLY SET TO 500

9. WRITE LOCK TEST

THE WRITE LOCK TEST REQUIRES OPERATOR INTERVENTION. THE STARTING ADDRESS FOR THIS TEST IS 220. THE PROGRAM WILL TELL THE OPERATOR WHICH SWITCHES HAVE TO BE SET.

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318
319                          10.  TEST DESCRIPTION
```

DESCRIPTION

1. TEST RSCS2

   CLEAR ALL READ/WRITE BITS AND CHECK. SET ALL R/W BITS AND CHECK. NOW CLEAR AND RECHECK.

2. TEST FOR ONLINE DRIVES

   SET ERROR BITS IN RSER. THIS CAUSES ATTENTION SUMMARY BITS TO SET IN RSAS. DO FOR ALL DRIVES. RSAS HAS NOT YET BEEN TESTED. SO IN THE CASE OF NO BITS IN RSAS SETTING, DRIVE 0 IS TESTED.

3. RESET TEST FOR REGISTERS

   SET ALL R/W BITS IN RSCS1, RSCS2, RSBA, RSDA, RSER, RSWC, RSDB, AND RSMR. DO A RESET AND TEST ALL R/W BITS TO BE CLEARED.

4. SET AND CLEAR ALL REGISTERS

   SET ALL R/W BITS IN RSCS1, RSCS2, RSBA, RSDA, RSER, RSWC, RSDB AND RSMR AND TEST. SET ALTERNATE BITS AND CHECK TO MAKE SURE BITS ARE NOT TIED TOGETHER. NOW SET ALL BITS AND CLEAR THEM TO MAKE SURE ALL CAN BE CLEARED ONCE SET.

5. RANDOM NUMBER TEST FOR RSWC AND RSDA

   THIS TEST GENERATES RANDOM NUMBERS AND LOADS THEM INTO RSWC, RSDA AND RSBA.

6. TEST "CLEAR BIT" IN RSCS2

   SET ALL R/W BITS IN RSCS1, RSCS2, RSBA, RSDA, RSER, RSWC RSDB, AND RSMR. SET CLEAR BIT IN RSCS2. NOW TEST ALL R/W BITS FOR 0 IN ALL THE ABOVE REGISTERS.

7. TEST DLT AND TRE BITS

   DO A READ FROM THE SILO. THIS SHOULD CAUSE A DLT AND A TRE ERROR BECAUSE THE SILO IS EMPTY.

8. CLEAR DLT AND TRE

   CLEAR BY SETTING TRE IN RSCS1 AND TEST.

9. LOAD RSDB WITH ALL ONES AND ALL ZEROS

   LOAD RSDB WITH A WORD OF ZEROS AND A WORD OF ONES. WAIT FOR "OR" TO SET AND THEN CHECK OUTPUT OF SILO. IF OR DID NOT SET ERROR MESSAGE APPEARS.

10. TEST FOR 66 LOCATIONS IN SILO

376
377 THIS IS DONE BY PUTTING A BINARY COUNT IN EVERY LOCATION AND

CHECKING THE OUTPUT FOR 66 WORDS.

11. TEST DLT ERROR

THIS IS DONE BY LOADING THE SILO WITH 67 WORDS WITHOUT READING ANY OUT. THIS SHOULD CAUSE DLT TO SET.

12. FLOAT A "1" AND A "0" THROUGH THE SILO

LOAD THE SILO WITH A WORD OF ZEROS AND FLOAT A "1" THROUGH THE WORD. THEN LOAD THE SILO WITH A WORD OF ALL ONES AND FLOAT A "0" THROUGH THE WORD. CHECK THE OUTPUT OF THE SILO FOR THE CORRECT ANSWER.

13. TEST NO-OP FUNCTION

THE NO-OP FUNCTION IS TESTED WITH AND WITHOUT ERROR BITS SET. ALL THE REGISTERS ARE CHECKED AFTER BOTH CASES.

14. TEST DRIVE CLEAR FUNCTION

FIRST SET ALL R/W BITS IN RSDA, RSWC, RSER, AND RSMR. DO A DRIVE CLEAR FUNCTION. NOW TEST ALL REGISTERS FOR CORRECT DATA.

15. EXECUTE A ONE WORD WRITE FUNCTION

SET RSWC TO -1. MOV -1 INTO OUTBUF. LOAD RSBA WITH OUTBUF. DO A WRITE TEST RDY BIT FOR 0 THEN WAIT FOR IT TO SET. TIME OUT TO ERROR IF RDY BIT DOESN'T SET AND CHECK FOR ERROR CONDITIONS. TEST RSDA FOR CORRECT ADDRESS. TEST WORD COUNT FOR 0. THIS IS TESTED ON -A- AND -B- PORT.

16. EXECUTE A ONE WORD WRITE CHECK

SET UP RSDA, RSBA, RSWC AND OUTBUF AS IN THE WRITE FUNCTION TEST. DO A WRITE CHECK FUNCTION. TEST RDY AS DONE IN THE WRITE TEST. CHECK FOR WRITE CHECK ERROR. THEN TEST RSDA, RSWC AND RSBA FOR CORRECT DATA. THIS IS TESTED ON -A- AND -B- PORT.

17. TEST READ FUNCTION

SETUP RSDA, RSBA, RSWC AND OUTBUF AS IN THE WRITE FUNCTION DO A READ FUNCTION. TEST RDY BIT AS DONE IN THE WRITE FUNCTION. TEST FOR ERRORS. ALSO TEST RSDA, RSWC AND RSBA FOR CORRECT DATA. THIS IS TESTED ON -A- AND -B- PORT.

18. TEST BLOCK SEARCH FUNCTION, PIP AND DRY BITS AND ADDR. CONF. BIT

DO A BLOCK SEARCH FOR SECTOR 32, LOOP ON ADDR. CONF. BIT IN

```
                                RSMR.   IF  IT DOESN'T SET, TIMEOUT.  WHEN YOU GET THERE DO A
                                BLOCK SEARCH FOR SECTOR 0.  NOW WE KNOW THAT WE HAVE TIME  TO
```

TEST FOR DRY AND PIP BITS BEFORE FINDING SECTOR 0. FOR PIP SHOULD SET AND DRY SHOULD CLEAR BEFORE FINDING SECTOR 0. ONCE SECTOR 0 IS FOUND PIP SHOULD CLEAR AND DRY SHOULD SET. IF DRY DOES NOT SET A TIME OUT ERROR WILL OCCUR INDICATING SECTOR 0 WAS NOT FOUND. SC IN RSCS1 SHOULD ALSO SET. RSBA AND RSWC SHOULD NOT MOVE, THIS IS ALSO TESTED.

19. ILLEGAL FUNCTION CODE TEST

IN THIS TEST RSBA, RSWC AND RSDA ARE SET UP AS IF TO DO A LEGAL FUNCTION. AN ILLEGAL FUNCTION IS THEN EXECUTED. THE PROGRAM TEST FOR ILF AND ERR BITS TO SET. RSBA, RSWC AND RSDA ARE ALSO TESTED FOR CORRECT DATA. THIS IS DONE FOR ALL THE ILLEGAL FUNCTIONS.

FOR AN AID IN TROUBLE SHOOTING THE ILLEGAL FUNCTION CODE CAN BE LOADED INTO LOCATION ILLTAB OR ILFTB2, DEPENDING ON WHICH ILLEGAL FUNCTION TEST YOU WISH TO LOOP ON. IN THE NEXT LOCATION, FOLLOWING THE ILLEGAL FUNCTION, A 0 MUST BE LOADED. NOW BY SETTING SWITCH 14 (LOOP ON TEST), YOU WILL LOOP ON THE ILLEGAL FUNCTION.

20. TEST PAR IN RSER

SET PAR IN RSER AND CHECK. ALSO TEST ERR IN RSDS TO SET BECAUSE OF THE PAR SETTING.

21. TEST DPR AND MOL IN RSDS

BOTH THESE BITS SHOULD BE SET IN RSDS IF THE DRIVE IS ON LINE AND UP TO SPEED.

22. LOOK AHEAD TEST

FIRST CHECK TO SEE IF SECTOR FRACTION BITS ARE MOVING. NOW SET RSDA TO 0 AND INCREMENT IT EVERY TIME THE ADDR.CONF BIT SETS. IF THE ADDR.CONF BIT DOES NOT SET IN A CERTAIN LENGTH OF TIME, A TIME OUT ERROR OCCURS.

23. PARITY TEST

THIS WILL TEST THE PARITY LOGIC ONLY IF THERE IS PARITY MEMORY ON THE SYSTEM IN LESS THAN 28K. IT WILL WRITE BAD PARITY IN A MEMORY LOCATION THEN TRY TO DO A WRITE TO THE DRIVE FROM THAT LOCATION. THIS SHOULD CAUSE A PARITY ERROR.

24. TEST WRITE CHECK ERROR

IN THIS TEST THE PROGRAM WRITES A -1 ON TO THE DISK. A 0 IS NOW FLOATED THROUGH THE WORD IN THE BUS ADDRESS LOCATION, AND A WRITE CHECK FUNCTION IS DONE. THE WCE BIT IN RSCS2 SHOULD SET AND SHOULD CAUSE THE TRE BIT IN RSCS1 TO SET. THESE BITS

```
492                                     ARE THEN CLEARED.  A WORD OF 0 IS NOW WRITTEN ON THE DISK AND
493                                     A  1  IS  FLOATED THROUGH THE WORD IN THE BUS ADDRESS AND THE
```

WRITE CHECK FUNCTION TEST IS REPEATED.

25. TEST PROGRAM ERROR BIT IN RSCS2

HERE THE PROGRAM ATTEMPTS TO INITIATE A DATA TRANSFER OPERATION WHILE THE CONTROL IS CURRENTLY PERFORMING ONE. THIS SHOULD CAUSE PGE TO SET WHICH SHOULD CAUSE TRE TO SET. THESE BITS ARE THEN CLEARED. RSWC IS ALSO TESTED FOR IT SHOULD NOT BE 0 FOR THE CURRENT OPERATION SHOULD HAVE BEEN ABORTED DUE TO THE PGE ERROR.

26. TEST RMR IN RSER

HERE A WRITE COMMAND IS GIVEN AND DURING ITS EXECUTION THE PROGRAM TRYS TO MODIFY THE RSDA REG. THIS SHOULD CAUSE THE RMR BIT TO SET WHICH CAUSES THE ERR BIT TO SET. THESE BITS ARE THEN CLEARED.

27. TEST DCK IN RSER

HERE A WRITE COMMAND IS GIVEN THEN DURING THIS FUNCTION A DRIVE CLEAR COMMAND IS GIVEN. THIS SHOULD CAUSE THE DCK BIT TO SET WHICH SHOULD CAUSE THE ERR BIT TO SET. THESE BITS ARE THEN CLEARED.

28. TEST DISK ADDRESS REGISTER

LOAD THE LAST DISK ADDRESS (7777) INTO RSDA. DO A ONE WORD WRITE AND CHECK THAT RSDA INCREMENTED TO 10000.

29. TEST IAE ERROR

DO A ONE WORD WRITE BUT FIRST SET RSDA TO AN INVALID ADDRESS SUCH AS 10000. THIS SHOULD CAUSE A IAE ERROR WHICH WILL CAUSE ERR, ATA AND SC BITS TO SET. THESE BITS ARE THEN CLEARED BY LOADING A 1 INTO ATA IN RSAS.

30. TEST FOR NON-EXISTENT DISK ERROR

FIRST FIND A DRIVE THAT IS NOT ON THE SYSTEM OR OFF LINE. NOW TRY TO DO A ONE WORD WRITE TO THAT DRIVE. NED IN RSCS2 SHOULD SET WHICH SHOULD CAUSE TRE TO SET. THESE BITS ARE THEN CLEARED BY MOVING A 1 INTO TRE.

31. TEST DAO IN RSER AND LBT IN RSDS

SET RSDA TO ITS LAST ADDRESS. NOW WRITE ONE SECTOR PLUS ONE WORD. DAO SHOULD SET AND LBT SHOULD SET. THESE SHOULD CAUSE ERR, ATA, TRE AND SC TO SET. THESE ARE CLEARED BY DOING A CLEAR.

32. TEST BAI IN RSCS2

```
550
551                                     SET BAI IN RSCS2.  DO A ONE WORD WRITE AND CHECK RSBA TO  SEE
```

IF IT INCREMENTED.

33. TEST NON-EXISTENT MEMORY ERROR BIT IN RSCS2

SET BITS A16 AND A17 IN RSCS1 FOR AN 18 BIT ADDRESS. MOV 173000 INTO RSBA. MOV -1000 INTO RSWC AND DO A WRITE FUNCTION. THE NEM BIT SHOULD SET AND SHOULD CAUSE TRE TO SET. CLEAR THESE BITS BY LOADING A 1 INTO TRE.

34. TEST FOR ZERO'S IN A PARTIALLY FILLED SECTOR

FIRST WRITE A COMPLETE SECTOR WITH ALL ONES. THEN DO A ONE WORD WRITE. THE REMAINING 63 WORDS SHOULD BE WRITTEN AS ZERO'S. NOW DO A WRITE CHECK TO COMPARE FOR THESE ZERO'S.

35. PRIORITY INTERRUPT TEST

HERE THE PROGRAM ENABLES THE INTERRUPT AND DOES A ONE WORD WRITE FUNCTION. THE PROGRAM SHOULD NOT TRAP UNTIL THE PROCESSOR IS DROPPED TO PRIORITY 4.

36. DYNAMIC FUNCTION TEST

WHILE ONE DRIVE IS READING, THE UNIT # IN RSCS2 IS MODIFIED. IF THERE IS ANOTHER DRIVE ON THE SYSTEM, A DRIVE SEARCH IS PERFORMED ON IT. THIS IS ALL DONE WHILE THE FIRST DRIVE IS STILL READING.

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                                        %
                                .TITLE  MAINDEC-11-DZRSB-E      RH11-RS03LA-RS03-RS04 BASIC FUNCTION DIAGNOSTIC
                                ;COPYRIGHT 1973,1974,1975,1976 DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
                                ;PROGRAM BY STANLEY HARACKIEWICZ


                                ;          SWITCH                       USE
                                ;          ------                       ------------------
                    100000                      SW15=   100000          ;HALT ON ERROR
                    040000                      SW14=   40000           ;LOOP ON TEST
                    020000                      SW13=   20000           ;INHIBIT ERROR TYPEOUTS
                    010000                      SW12=   10000           ;INHIBIT OBUFSV FROM CHANGING FOR -B- PORT ONLY
                    004000                      SW11=   4000            ;INHIBIT ITERATIONS
                    002000                      SW10=   2000            ;0 - BELL ON PASS COMPLETE
                                                                        ;1 - BELL ON ERROR
                    001000                      SW9=    1000            ;LOOP ON ERROR
                    000400                      SW8=    400             ;LOOP ON TEST IN SW<7:0>
                    000000              .=      0                       ;TRAP CATCHER FROM 0 - 776
                    000046              .=      46                      ;HOOKS FOR ACT 11
000046  022026              $ENDAD
                    000052              .=      52
000052  040000              BIT14

                    000174              .=      174                     ;SOFTWARE SWITCK REGISTER LOCATION
000174  000000              DISPREG:0
000176  000000              SWREG:  0

                    000200              .=      200
000200  000137  000230              JMP     @#STRT

                    000220              .=      220
000220  000137  024354              JMP     @#WRTLCK        ;WRITE LOCK TEST

                    000230              .=      230
000230  042737  004000  001160  STRT:  BIC     #BIT11,ONCEE    ;CLEAR TKSEL TEST FLAG
000236  000137  001202              JMP     @#BEGIN         ;STARTING ADDRESS IS BEGIN

                                ;STARTING ADDRESSES  FOR SWITCH REGISTER TESTING OF RH-RS REGISTERS

                    000250              .=      250
000250  000137  023466              JMP     @#SRSWC         ;WORD COUNT REG
000254  000137  023512              JMP     @#SRSBA         ;BUS ADDR REG
000260  000137  023536              JMP     @#SRSDA         ;DISK ADDR REG
000264  000137  023562              JMP     @#SRSDS         ;DRIVE STATUS REG
000270  000137  023606              JMP     @#SRSER         ;ERROR REG
000274  000137  023632              JMP     @#SRSLA         ;LOOK AHEAD REG
000300  000137  023642              JMP     @#SRCS2         ;CS2 REG
000304  000137  023666              JMP     @#SRAS          ;ATTENTION SUMMARY REG
000310  000137  023712              JMP     @#RSMRR         ;MAINTENANCE REG
000314  000137  023736              JMP     @#SRSCS1        ;CS1 REG

                    000320              .=      320
000320  052737  004000  001160          BIS     #BIT11,ONCEE    ;SET TKSEL TEST FLAG
000326  000137  001202              JMP     @#BEGIN         ;ENABLES OPERATOR TO DO A
                                                            ;WRITE OR READ TO A DESIRED ADDR
                                                            ;OPTIONAL WC, DA, AND UNIT #
```

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```
                                
000001          N=      1       ;INITALIZE FOR NEWTST
104000          HLT=    EMT     ;SET HLT TO EMT FOR ERROR TYPEOUTS
177776          PS=     177776  ;PROCESSOR STATUS
177776          PSW=    PS      ;PROCESSOR STATUS WORD
000007          BELL=   7       ;BELL
000000          R0=     %0      ;R0 - DEFINE REGISTERS
000001          R1=     %1      ;R1
000002          R2=     %2      ;R2
000003          R3=     %3      ;R3
000004          R4=     %4      ;R4
000005          R5=     %5      ;R5
000006          SP=     %6      ;R6 - STACK POINTER
000007          PC=     %7      ;R7 - PROGRAM COUNTER
000001          BIT0=   1       ;BIT EQUATES
000002          BIT1=   2
000004          BIT2=   4
000010          BIT3=   10
000020          BIT4=   20
000040          BIT5=   40
000100          BIT6=   100
000200          BIT7=   200
000400          BIT8=   400
001000          BIT9=   1000
002000          BIT10=  2000
004000          BIT11=  4000
010000          BIT12=  10000
020000          BIT13=  20000
040000          BIT14=  40000
100000          BIT15=  100000
000001  GOOD=    %1              ;FOR GOOD DATA
000000  BAD=     %0              ;FOR BAD DATA
                                
```

```
                    001000                  .=      1000
                    
001000  000000      ICNT:   0               ;LH = ITERATION COUNT  ;RH = TEST NO.
001002  000000      ERRORS: 0               ;ERROR COUNT
001004  000000 000000 PCNT:  0,0             ;2 WORD PASS COUNT
001010  000000      LAD:    0               ;LOOP ADDRESS FOR SCOPE
001012  000000      HLTADR: 0               ;ADDRESS OF LAST HLT INSTRUCTION  EXECUTED
001014  001000      FILCHR: 1000            ;FILCHR=0 (CHAR)  ;FILCHR+1=2 (COUNT)
001016  177564      TPS:    177564          ;OUTPUT STATUS REGISTER
001020  177560      TKS:    177560
001022  177562      TKB:    177562
001024  177566      TPB:    177566          ;OUTPUT BUFFER
001026  177570      SWR:    177570          ;SWITCH REGISTER
001030  177570      DISPLAY:177570          ;DISPLAY REGISTER
                    
                    001100  .=      1100
001100  000000      SAVBAD: 0               ;LOC FOR ILLEGAL FUNCTION CODE
001102  000000      OBUFSV: 0               ;LOC OF OUTBUF
                    
                    ;DISK I/O REGISTERS
                    
001104  172040      RSCS1:  172040          ;DISK CONTROL + STATUS REGISTER
001106  172050      RSCS2:  172050          ;DISK CONTROL + STATUS REGISTER
001110  172042      RSWC:   172042          ;WORD COUNT REGISTER
001112  172044      RSBA:   172044          ;BUS ADDRESS
001114  172046      RSDA:   172046          ;DISK ADDRESS (DESIRED ADDRESS)
001116  172052      RSDS:   172052          ;DRIVE STATUS
001120  172054      RSER:   172054          ;ERROR REG.
001122  172056      RSAS:   172056          ;ATTENTION SUMMARY
001124  172060      RSLA:   172060          ;LOOK AHEAD
001126  172062      RSDB:   172062          ;DATA BUFFER REGISTER
001130  172064      RSMR:   172064          ;MAINTENANCE REGISTER
001132  172066      RSDT:   172066          ;DRIVE TYPE REGISTER
001134  000204      RSVEC:  204             ;INTERUPT VECTOR
001136  000206      RSVCPS: 206             ;INTERRUPT PRIO. VECTOR
001140  172041      RSCS1B: 172041          ;ODD BYTE ADD FOR CS1
001142  172051      RSCS2B: 172051          ;ODD BYTE ADD FOR CS2
001144  172043      RSWCB:  172043          ;ODD BYTE ADD FOR CW
001146  172045      RSBAB:  172045          ;ODD BYTE ADD FOR BA
                    
                    ;MEMORY MANAGEMENT REGISTER ASSIGNMENTS
                    
                            177572          SR0=177572
                            172340          KIPAR0=172340
                            172342          KIPAR1=172342
                            172344          KIPAR2=172344
                            172356          KIPAR7=172356
                            172300          KIPDR0=172300
                            172302          KIPDR1=172302
                            172304          KIPDR2=172304
                            172316          KIPDR7=172316
                            000006          RW=6
                            000000          UP=00
```

```
                        ;BIT ASSIGNMENTS FOR ERROR TYPEOUTS
                        ;THE RS REGISTERS ARE DIVIDED INTO 3 GROUPS.
                        ;CS1,CS2 AND ER ARE IN THE FIRST GROUP.THIS GROUP IS ALWAYS
                        ;TYPED WITH EITHER OF THE OTHER GROUPS. AS,BA,DA, WC AND DS
                        ;ARE IN THE SECOND GROUP. DT,DB,MR, AND LA ARE IN THE 3RD
                        ;GROUP.YOU CAN NOT INTERMIX GROUP 2 OR 3. THEY HAVE
                        ;TO BE TYPED SEPERATELY.
                        ;EXAMPLE:   HLT !CS1,AS,BA
                        ;           HLT !CS1!DT!DB

000001                      CS1=1           ;CONTROL AND STATUS 1
000002                      ER=2            ;CONTROL AND STATUS 2
000004                      DA=4            ;DESIRED ADD
000010                      WC=10           ;WORD COUNT
000020                      BA=20           ;BUS ADDRESS
000040                      DS=40           ;DRIVE STATUS
000100                      AS=100          ;ATTENTION SUMMARY
000200                      CS2=200         ;CONTROL AND STATUS REG
000204                      LA=204          ;LOOK AHEAD
000210                      DB=210          ;DATA BUFFER
000220                      MR=220          ;MAINTENANCE
000240                      DT=240          ;DRIVE TYPE

                    ;BIT ASSIGNMENTS FOR THE REGISTER BITS

040000                      TRE=40000       ;TRANSFER ERROR CS1
100000                      SC=100000       ;SPECIAL CONDITIONS CS1
000100                      IR=100          ;INPUT READY CS2
000200                      OR=200          ;OUTPUT READY CS2
002000                      PGE=2000        ;PROGRAM ERROR-CS2
010000                      NED=10000       ;NON-EXISTENT DRIVE CS2
040000                      WCE=40000       ;WRITE CHECK ERROR-CS2
100000                      DLT=100000      ;DATA LATE ERROR CS2
000200                      DRY=200         ;DRIVE READY DS
020000                      PIP=20000       ;POSITIONING IN PROGRESS DS
002000                      LBT=2000        ;LAST BLOCK TRANSFER-DS
040000                      ERR=40000       ;ERROR DS
100000                      ATA=100000      ;ATTENTION ACTIVE-DS
001000                      DAO=1000        ;DISK OVERFLOW ERROR-ER
100000                      DCK=100000      ;DATA CHECK ERROR-ER
000010                      BAI=10          ;BUS ADDR INCREMENT INHIBIT
000100                      IE=100          ;INTERRUPT INABLE CS1
```

```
                                        ;WORKING LOCATIONS
                                        
001150  146723                          RANNU:  146723                  ;RANDOM NUMBER PRIME
001152  000000                          UNNUM:  0                       ;UNIT CURRENTLY BEING TESTED
001154  000000                          UNITSV: 0                       ;SET BIT=UNIT ON BUS
001156  000000                          UNCMP:  0                       ;FOR COMPARING FOR # OF DEVICE
001160  000000                          ONCEE:  0                       ;DID WE TEST ANY DRIVES
001162  000000                          RS04DT: 0                       ;CLR IF RS03 SET IF RS04
001164  000000                          TIMSV:  0                       ;SAVE LOC FOR TIME
001166  000000                          A0BI:   0                       ;PORT SWITCH
        000004                          WWP=4                           ;WRITE WRONG PARITY
        172100                          MPR0=172100                     ;PARITY REG
001170  000000                          BPORTT: 0                       ;BUFFER ADDR FOR -B- PORT
001172  000000                          SAVEE:  0                       ;WORK LOC
                                        
                                        ;DISCRIPTION OF ONCEE BITS
                                        ;BIT0 MEANS FOUND DRIVE
                                        ;BIT11 DO TKSEL TEST
                                        ;BIT12 TYPE COULD NOT FIND NED ONLY ONCE
                                        ;BIT13 TYPE NO MEM ON B PORT ONLY ONCE
                                        ;BIT14 0- DO WCE WITH 0 -1 DO WCE WITH 1
                                        ;BIT15 MEANS ERROR FOUND
                                        
                                        ;RH11 WORK REGISTERS
                                        ;(CAN BE CHANGED IN ANY ROUTINE)
001174  000000                          WORK:   0
001176  000000                          WORK1:  0
001200  000000                          WORK2:  0
                                        
001202  012706  000500                  BEGIN:  MOV     #500,SP         ;SET STACK TO  *** 500 ***
001206  012737  022770  000024                  MOV     #.POWER,@#24    ;SET UP PF VECTOR
001214  012737  000340  000026                  MOV     #340,@#26       ;LOCK OUT THE WORLD
001222  012737  022416  000030                  MOV     #.HLT,@#30      ;SET EMT VECTOR
001230  012737  000340  000032                  MOV     #340,@#32       ;LOCK UP
001236  012737  023422  000034                  MOV     #.TRAP,@#34     ;SET TRAP VECTOR
001244  012737  000340  000036                  MOV     #340,@#36       ;LOCK UP
001252  005037  001000                          CLR     ICNT            ;INIT ICNT
001256  005037  001010                          CLR     LAD             ;INIT LAD
001262  042737  143777  001160                  BIC     #143777,ONCEE   ;CLEAR ONCEE
001270  012737  027364  001102                  MOV     #OUTBUF,OBUFSV  ;SAVE LOC OF OUTBUFFER
001276  032737  004000  001160                  BIT     #BIT11,ONCEE    ;DO TKSEL TEST?
001304  001402                                  BEQ     .+6             ;NO
001306  000137  024014                          JMP     @#TKSEL         ;YES
001312  104420                                  SUSWR                   ;SIZE FOR HDWR SWR
```

```
                                        ;NOW TEST FOR DRIVES
                                        ;*************************************************************************
                                        ;TEST 1         TEST FOR DRIVES
                                        ;*************************************************************************
001314  104400                  TST1:   SCOPE

001316  012701  000010          MULTII: MOV     #8.,R1          ;PUT 8 INTO R1 FOR COUNT
001322  005077  177560                  CLR     @RSCS2          ;SET DEVICE TO ZERO
001326  012777  000007  177564  TRY:    MOV     #7,@RSER        ;CAUSE AN ERROR +SETS BIT IN RSAS REG
001334  005301                          DEC     R1              ;DO A MAXIMUM OF 8 TIMES
001336  001403                          BEQ     DVNUM           ;TESTED FOR ALL DRIVES GET OUT
001340  005277  177542                  INC     @RSCS2          ;INCREMENT DRIVE UNIT
001344  000770                          BR      TRY             ;REPEAT FOR NEXT DRIVE
001346  017737  177550  001154  DVNUM:  MOV     @RSAS,UNITSV    ;SAVE
001354  012737  000401  001156          MOV     #401,UNCMP      ;SETUP TO CMP WITH UNITSV
001362  012737  000000  001152          MOV     #0,UNNUM        ;PUT 0 INTO UNIT NO.
001370  032777  020000  177430          BIT     #BIT13,@SWR     ;INHIBIT TYPE OUT?
001376  001015                          BNE     STTEST          ;YES
001400  104402  001404                  TYPE    .+2             ;.ASCIZ <15><12>"TESTING UNIT "
001424  042737  100000  001160          BIC     #BIT15,ONCEE    ;CLEAR ERROR FLAG
001432  033737  001156  001154  STTEST: BIT     UNCMP,UNITSV    ;IS THIS DRIVE ON THE SYSTEM
001440  001475                          BEQ     TRYNX           ;NO
001442  013777  001152  177436          MOV     UNNUM,@RSCS2    ;YES PUT UNIT # INTO CS2
001450  022777  000004  177454          CMP     #4,@RSDT        ;IS THIS A RS03LA?
001456  001004                          BNE     7$              ;NO
001460  012737  000004  001162          MOV     #4,RS04DT       ;SETUP DRIVE TYPE FOR A LA DISK
001466  000435                          BR      1$              ;GET OUT
001470  022777  000000  177434  7$:     CMP     #0,@RSDT        ;IS THIS A RS03?
001476  001003                          BNE     2$              ;NO
001500  005037  001162                  CLR     RS04DT          ;YES
001504  000426                          BR      1$              ;GET OUT
001506  022777  000001  177416  2$:     CMP     #1,@RSDT        ;IS THIS A RS03 4US?
001514  001003                          BNE     3$              ;NO
001516  005037  001162                  CLR     RS04DT          ;RS03
001522  000417                          BR      1$              ;GET OUT
001524  022777  000002  177400  3$:     CMP     #2,@RSDT        ;IS THIS A RS04?
001532  001410                          BEQ     6$              ;YES
001534  022777  000003  177370          CMP     #3,@RSDT        ;IS IT A RS04?
001542  001404                          BEQ     6$              ;YES
001544  043737  001156  001154          BIC     UNCMP,UNITSV    ;CLEAR UNWANTED ATA BIT
001552  000430                          BR      TRYNX           ;GET A NEW NUMBER
001554  052737  177777  001162  6$:     BIS     #-1,RS04DT      ;YES RS04
001562  032777  020000  177236  1$:     BIT     #BIT13,@SWR     ;INHIBIT TYPE OUT?
001570  001020                          BNE     4$              ;YES
001572  032737  100000  001160          BIT     #BIT15,ONCEE    ;ANY ERRORS?
001600  001404                          BEQ     5$              ;NO
001602  104402  001606                  TYPE    ,.+2            ;.ASCIZ <15><12><12>
001612                          5$:
001612  013746  001152                  MOV     UNNUM,-(6)      ;PUT UNNUM ON STACK
001616  104406                          TYPES                   ;TYPE STACK IN OCTAL - SUPRESS
001620  104402  000040                  TYPE    ,40             ;TYPE SPACE
001624  042737  100000  001160          BIC     #BIT15,ONCEE    ;CLEAR ERROR FLAG
001632  000473                  4$:     BR      NOWGO           ;NOW TEST
```

```
                                TRYNX:  ASL     UNCMP           ;CHECK NEXT BIT FOR DRIVE
                                        BCS     CHCKDV          ;DID WE TEST ANY REG?
                                        INC     UNNUM           ;INC UNIT #
                                        BR      STTEST          ;CHECK FOR NEXT DRIVE

                                CHCKDV: BIT     #BIT0,ONCEE     ;DID WE TEST ANY DRIVES?
                                        BNE     DONEE           ;YES WE DID TEST A DRIVE
                                        MOV     #100000,UNCMP   ;NO DRIVES TESTED, COULD NOT SET
                                        CLR     UNNUM           ;ANY AS BITS, THUS DEFAULTS TO
                                        BIT     #BIT13,@SWR     ;INHIBIT TYPE OUT?
                                        BNE     4$              ;YES
                                        MOV     UNNUM,-(6)      ;PUT UNNUM ON STACK
                                        TYPES                   ;TYPE STACK IN OCTAL - SUPRESS
                                        TYPE    ,40             ;TYPE SPACE
                                        TYPE    ,.+2            ;.ASCIZ <15><12>"COULD NOT FIND DRIVE WILL TEST DRIVE 0
                                        HALT                    ;WAIT
                                4$:     BR      NOWGO           ;TEST DRIVE 0
                                DONEE:  JMP     DONE            ;GET OUT

                                ;THIS TEST IS DESIGNED TO TEST THE ABILITY OF RESET
                                ;TO CLEAR ALL THE RH AND RS REGISTERS

                                NOWGO:  MOV     #OUTBUF,OBUFSV  ;SAVE LOC OF OUTBUFFER
                                        BIS     #BIT0,ONCEE     ;SET FOUND DRIVE FLAG
                                        MOV     TIMES,TIMSV     ;SAVE TIME
                                        MOV     #1,TIMES        ;ONLY TEST ONCE
                                ;*************************************************************************
                                ;TEST 2         RESET TEST FOR REGISTERS
                                ;*************************************************************************
                                TST2:   SCOPE
                                        MOV     #340,@#PS       ;LOCK OUT INTERUPTS
                                        MOV     UNNUM,@RSCS2    ;GET UNIT #
                                        MOV     #177776,@RSCS1  ;SET ALL
                                        MOV     #177777,@RSBA   ;POSSIBLE R/W
                                        MOV     #177777,@RSDA   ;BITS IN THESE REGISTERS
                                        MOV     #177777,@RSER
                                        MOV     #177777,@RSMR
                                        MOV     #177777,@RSWC
                                        MOV     #177737,@RSCS2
                                        RESET                   ;CLEAR ALL BITS IN ALL REG.

                                ;TEST RSCS2 FOR CLEARED BITS

                                        CMP     #100,@RSCS2     ;DID THESE BITS GET CLEARED?
                                        BEQ     .+4             ;YES
                                        HLT     !CS2            ;(417) SHOULD BE CLEARED IN CS2
                                        MOV     UNNUM,@RSCS2    ;PUT # OF UNIT IN TEST IN CS2
                                        CMP     #10600,@RSDS    ;IS DPR AND MOL SET?
                                        BEQ     .+4             ;YES
                                        HLT     !DS             ;NO WHY NOT?
                                ;TEST CONTROL AND STATUS REG 1
                                        CMP     #4200,@RSCS1    ;DID THE READY BIT SET?
                                        BEQ     .+4             ;YES
                                        HLT     !CS1            ;READY SHOULD BE SET
```

```
                                        ;TEST BUS ADDRESS REGISTER

002210  005777  176676                          TST     @RSBA           ;IS BA REG. CLEARED
002214  001401                                  BEQ     .+4             ;YES
002216  104020                                  HLT     !BA             ;SHOULD BE 0

                                        ;TEST DISK ADDRESS REGISTER

002220  005777  176670                          TST     @RSDA           ;IS DA CLEARED
002224  001401                                  BEQ     .+4             ;YES
002226  104004                                  HLT     !DA             ;SHOULD BE 0

                                        ;TEST ERROR REG RSER

002230  005777  176664                          TST     @RSER           ;DID RSER CLEAR?
002234  001401                                  BEQ     .+4             ;YES
002236  104002                                  HLT     !ER             ;BITS(157015) SHOULD BE CLEARED

                                        ;TEST RS MAINTENANCE REGISTER

002240  032777  000077  176662                  BIT     #77,@RSMR       ;DID THESE BITS GET CLEARED
002246  001401                                  BEQ     .+4             ;YES
002250  104220                                  HLT     !MR             ;BITS(77) SHOULD BE 0

                                        ;TEST WC REG IT SHOULD NOT CHANGE

002252  022777  177777  176630                  CMP     #177777,@RSWC   ;DID IT CHANGE?
002260  001401                                  BEQ     .+4             ;NO
002262  104010                                  HLT     !WC             ;RESET SHOULD NOT MODIFY RSWC

                                        ;TEST RSAS

002264  005777  176632                          TST     @RSAS           ;IS REG CLEAR
002270  001401                                  BEQ     .+4             ;YES
002272  104100                                  HLT     !AS             ;NO
```

```
                                ;*****************************************************************************
                                ;TEST 3          TEST CLEAR BIT IN CS2 ON ALL THE R/W BITS
                                ;*****************************************************************************
002274  104400                  TST3:   SCOPE

002276  012737  000340  177776  TTAGG:  MOV     #340,@#PS       ;LOCK OUT INTERRUPTS
002304  013777  001152  176574          MOV     UNNUM,@RSCS2    ;GET UNIT #
002312  012777  043576  176564          MOV     #43576,@RSCS1   ;SET ALL
002320  012777  177777  176564          MOV     #177777,@RSBA   ;POSSIBLE
002326  012777  177777  176560          MOV     #177777,@RSDA   ;REGISTERS
002334  012777  177777  176556          MOV     #177777,@RSER
002342  012777  177777  176556          MOV     #177777,@RSDB
002350  012777  177777  176532          MOV     #177777,@RSWC
002356  012777  020417  176522          MOV     #20417,@RSCS2
002364  012777  000071  176536          MOV     #71,@RSMR
002372  012777  000040  176506          MOV     #40,@RSCS2      ;CLEAR ALL BITS
002400  022777  000100  176500          CMP     #100,@RSCS2     ;DID THE RIGHT BITS CLEAR?
002406  001401                          BEQ     .+4             ;YES
002410  104200                          HLT     !CS2            ;(417) SHOULD BE CLEARED IN CS2
002412  013777  001152  176466          MOV     UNNUM,@RSCS2    ;GET DRIVE NUMBER
002420  032777  173577  176456          BIT     #173577,@RSCS1  ;DID ALL BITS GET CLEARED
002426  001401                          BEQ     .+4             ;YES
002430  104001                          HLT     !CS1            ;NO, ALL BITS SHOULD BE 0
                                ;TEST BUS ADDRESS REGISTER

002432  005777  176454                  TST     @RSBA           ;IS BA REG. CLEARED
002436  001401                          BEQ     .+4             ;YES
002440  104020                          HLT     !BA             ;SHOULD BE 0

                                ;TEST DISK ADDRESS REGISTER

002442  005777  176446                  TST     @RSDA           ;IS DA CLEARED
002446  001401                          BEQ     .+4             ;YES
002450  104020                          HLT     !BA             ;SHOULD BE 0

                                ;TEST ERROR REG RSER

002452  005777  176442                  TST     @RSER           ;DID THESE BITS GET CLEARED
002456  001401                          BEQ     .+4             ;YES
002460  104002                          HLT     !ER             ;BITS(157015) SHOULD BE CLEARED

                                ;TEST RS MAINTENANCE REGISTER
002462  032777  000077  176440          BIT     #77,@RSMR       ;DID THESE BITS GET CLEARED
002470  001401                          BEQ     .+4             ;YES
002472  104220                          HLT     !MR             ;BITS(77) SHOULD BE 0

                                ;TEST WC REG. IT SHOULD NOT CHANGE
002474  022777  177777  176406          CMP     #177777,@RSWC   ;DID WC CHANGE
002502  001401                          BEQ     .+4             ;NO
002504  104010                          HLT     !WC             ;WHY DID IT CHANGE?
```

```
1005                                    ;*****************************************************************************
1006                                    ;TEST 4          SET AND CLEAR ALL REGISTERS
1007                                    ;*****************************************************************************
1008  002506  104400                    TST4:   SCOPE
1009                                    ;CAN WE SET THE FUNCTION BITS IN THE RSCS1 REG.
1010                                    ;BITS 7,6,5,4,3,2&1
1011
1012  002510  104414                            CLRDK                   ;CLEAR ALL RS REG
1013  002512  013737  001164  022414            MOV     TIMSV,TIMES     ;GET TIME
1014  002520  012777  003576  176356            MOV     #3576,@RSCS1    ;SET DISK FUNCTION BITS
1015  002526  022777  007776  176350            CMP     #7776,@RSCS1    ;ARE THESE BITS SET?
1016  002534  001401                            BEQ     .+4             ;NO
1017  002536  104001                            HLT     !CS1            ;SHOULD = 7776
1018  002540  012777  002524  176336            MOV     #2524,@RSCS1    ;SET THESE BITS
1019  002546  022777  006724  176330            CMP     #6724,@RSCS1    ;DID THEY SET
1020  002554  001401                            BEQ     .+4             ;YES
1021  002556  104001                            HLT     !CS1            ;SHOULD BE 6724
1022  002560  012777  001052  176316            MOV     #1052,@RSCS1    ;SET THESE BITS
1023  002566  022777  005252  176310            CMP     #5252,@RSCS1    ;ARE THEY =?
1024  002574  001401                            BEQ     .+4             ;YES
1025  002576  104001                            HLT     !CS1            ;SHOULD = 5252
1026  002600  104400                    TST5:   SCOPE
1027                                    ;CLEAR THE FUNCTION BITS
1028
1029  002602  012777  043576  176274            MOV     #43576,@RSCS1   ;SET DISK FUNCTION BITS
1030  002610  005077  176270                    CLR     @RSCS1
1031  002614  022777  004200  176262            CMP     #4200,@RSCS1    ;IS THE READY BIT SET
1032  002622  001401                            BEQ     .+4             ;YES
1033  002624  104001                            HLT     !CS1            ;RSCS1 SHOULD = 4200
1034
1035                                    ;*****************************************************************************
1036                                    ;TEST 6          TEST RSCS2
1037                                    ;*****************************************************************************
1038  002626  104400                    TST6:   SCOPE
1039
1040  002630  000005                            RESET                   ;CLEAR WORLD
1041  002632  022777  000100  176246            CMP     #100,@RSCS2     ;DID THEY CLEAR?
1042  002640  001401                            BEQ     .+4             ;YES
1043  002642  104200                            HLT     !CS2            ;NO
1044  002644  012777  021037  176234            MOV     #21037,@RSCS2   ;SET BITS 21017
1045  002652  022777  021137  176226            CMP     #21137,@RSCS2   ;DID THESE BITS GET SET
1046  002660  001405                            BEQ     1$              ;YES
1047  002662  017700  176220                    MOV     @RSCS2,BAD
1048  002666  012701  021137                    MOV     #21137,GOOD     ;WHAT CS2 SHOULD =
1049  002672  104000                            HLT                     ;CS2 = BAD GOOD = CORRECT ANS
```

```
1050  002674  012777  020025  176204  1$:     MOV     #20025,@RSCS2   ;SET THESE BITS
1051  002702  022777  020125  176176          CMP     #20125,@RSCS2   ;DID THESE BITS GET SET
1052  002710  001401                          BEQ     .+4             ;YES
1053  002712  104200                          HLT     !CS2            ;NO,CS2 SHOULD = 20125
1054  002714  012777  000012  176164          MOV     #12,@RSCS2      ;LOAD THESE BITS
1055  002722  022777  000112  176156          CMP     #112,@RSCS2     ;DID THESE BITS GET SET IN CS2
1056  002730  001401                          BEQ     .+4             ;YES
1057  002732  104200                          HLT     !CS2            ;BAD = CS2 GOOD = CORRECT ANS
1058  002734  012777  177777  176144          MOV     #-1,@RSCS2      ;SET BITS
1059  002742  005077  176140                  CLR     @RSCS2          ;CLEAR THEM
1060  002746  022777  000100  176132          CMP     #100,@RSCS2     ;DID CLEAR WORK
1061  002754  001401                          BEQ     .+4             ;YES
1062  002756  104200                          HLT     !CS2            ;R/W BITS DID NOT CLEAR
1063  002760  013777  001152  176120          MOV     UNNUM,@RSCS2    ;GET UNIT #
1064  002766  104400                  TST7:   SCOPE
1065                                  ;CAN WE SET ALL THE RSBA BITS
1066
1067  002770  012777  177777  176114          MOV     #177777,@RSBA   ;SET THE BITS
1068  002776  022777  177776  176106          CMP     #177776,@RSBA   ;DID THEY SET
1069  003004  001401                          BEQ     .+4             ;YES
1070  003006  104020                          HLT     !BA             ;BITS 17776 SHOULD BE SET
1071  003010  012777  125252  176074          MOV     #125252,@RSBA   ;SET THESE BITS
1072  003016  022777  125252  176066          CMP     #125252,@RSBA   ;ARE THEY =
1073  003024  001401                          BEQ     .+4             ;YES
1074  003026  104020                          HLT     !BA             ;SHOULD BE 125252
1075  003030  012777  052524  176054          MOV     #52524,@RSBA    ;SET THESE BITS
1076  003036  022777  052524  176046          CMP     #52524,@RSBA    ;ARE THEY =
1077  003044  001401                          BEQ     .+4             ;YES
1078  003046  104020                          HLT     !BA             ;SHOULD BE 52524
1079
1080  003050  104400                  TST10:  SCOPE
1081                                  ;FLOAT A 1 THROUGH RSBA
1082
1083  003052  012701  000002          FLOTBA: MOV     #2,GOOD         ;GET A 2
1084  003056  000241                          CLC                     ;CLEAR CARRY
1085  003060  010177  176026          1$:     MOV     GOOD,@RSBA      ;FLOAT NUMBER
1086  003064  017700  176022                  MOV     @RSBA,BAD       ;GET BA
1087  003070  020100                          CMP     GOOD,BAD        ;COMPARE BA
1088  003072  001401                          BEQ     .+4             ;BA CORRECT
1089  003074  104000                          HLT                     ;BAD=BA GOOD=CORRECT ANS
1090  003076  006101                          ROL     GOOD            ;ROTATE NUMBER
1091  003100  103367                          BCC     1$              ;LOOP TILL DONE
```

```
1092  003102  104400                    TST11:  SCOPE
1093
1094                                    ;CLEAR THE RSBA REGISTER
1095
1096  003104  012777  177777  176000            MOV     #177777,@RSBA   ;SET RSBA EQUAL TO ALL ONES
1097  003112  005077  175774                    CLR     @RSBA
1098  003116  005777  175770                    TST     @RSBA           ;TEST FOR BIT0 SET IN RSBA (READ ONLY BIT)
1099  003122  001401                            BEQ     .+4             ;YES
1100  003124  104020                            HLT     !BA             ;NO
1101  003126  104400                    TST12:  SCOPE
1102
1103                                    ;CAN WE SET ALL BITS IN RSWC REGISTER
1104
1105  003130  012777  177777  175752            MOV     #177777,@RSWC   ;SET WC BITS
1106  003136  022777  177777  175744            CMP     #177777,@RSWC   ;ARE ALL BITS SET
1107  003144  001401                            BEQ     .+4             ;YES
1108  003146  104010                            HLT     !WC             ;NO
1109  003150  012777  125252  175732            MOV     #125252,@RSWC   ;SET THESE BITS
1110  003156  022777  125252  175724            CMP     #125252,@RSWC   ;ARE THEY =
1111  003164  001401                            BEQ     .+4             ;YES
1112  003166  104010                            HLT     !WC             ;SHOULD BE 125252
1113  003170  012777  052525  175712            MOV     #52525,@RSWC    ;SET THESE BITS
1114  003176  022777  052525  175704            CMP     #52525,@RSWC    ;ARE THEY =
1115  003204  001401                            BEQ     .+4             ;YES
1116  003206  104010                            HLT     !WC             ;SHOULD BE 152525
1117  003210  104400                    TST13:  SCOPE
1118
1119                                    ;FLOAT A 1 THROUGH RSWC
1120
1121  003212  012701  000001            FLOTWC: MOV     #1,GOOD         ;GET A 1
1122  003216  000241                            CLC                     ;CLEAR CARRY
1123  003220  010177  175664            1$:     MOV     GOOD,@RSWC      ;FLOAT NUMBER
1124  003224  017700  175660                    MOV     @RSWC,BAD       ;GET WC
1125  003230  020100                            CMP     GOOD,BAD        ;COMPARE WC
1126  003232  001401                            BEQ     .+4             ;WC CORRECT
1127  003234  104000                            HLT                     ;BAD=WC GOOD=CORRECT ANS
1128  003236  006101                            ROL     GOOD            ;ROTATE NUMBER
1129  003240  103367                            BCC     1$              ;LOOP TILL DONE
```

```
1130
1131  003242  104400                          ;CLEAR THE WORD COUNT REGISTER
                                      TST14:  SCOPE
1132
1133  003244  012777  177777  175636          MOV     #177777,@RSWC   ;SET RSWC REGISTER EQUAL TO ALL ONES
1134  003252  005077  175632                  CLR     @RSWC
1135  003256  005777  175626                  TST     @RSWC           ;DID ALL BITS GET CLEARED
1136  003262  001401                          BEQ     .+4             ;YES
1137  003264  104010                          HLT     !WC             ;NO
1138  003266  104400                  TST15:  SCOPE
1139
1140                                  ;CAN WE SET ALL THE BITS IN THE RSDA REGISTER.
1141
1142  003270  012777  177777  175616          MOV     #177777,@RSDA   ;SET ALL BITS
1143  003276  022777  177777  175610          CMP     #177777,@RSDA   ;ARE THE BITS SET
1144  003304  001401                          BEQ     .+4             ;YES
1145  003306  104004                          HLT     !DA             ;NO
1146  003310  012777  125252  175576          MOV     #125252,@RSDA   ;SET THESE BITS
1147  003316  022777  125252  175570          CMP     #125252,@RSDA   ;ARE THEY =
1148  003324  001401                          BEQ     .+4             ;YES
1149  003326  104004                          HLT     !DA             ;SHOULD BE 125252
1150  003330  012777  052525  175556          MOV     #52525,@RSDA    ;SET THESE BITS
1151  003336  022777  052525  175550          CMP     #52525,@RSDA    ;ARE THEY =
1152  003344  001401                          BEQ     .+4             ;YES
1153  003346  104004                          HLT     !DA             ;SHOULD BE 52525
1154  003350  104400                  TST16:  SCOPE
1155
1156                                  ;FLOAT A 1 THROUGH RSDA
1157
1158  003352  012701  000001          FLOTDA: MOV     #1,GOOD         ;GET A 1
1159  003356  000241                          CLC                     ;CLEAR CARRY
1160  003360  010177  175530          1$:     MOV     GOOD,@RSDA      ;FLOAT NUMBER
1161  003364  017700  175524                  MOV     @RSDA,BAD       ;GET DA
1162  003370  020100                          CMP     GOOD,BAD        ;COMPARE DA
1163  003372  001401                          BEQ     .+4             ;DA CORRECT
1164  003374  104000                          HLT                     ;BAD=DA GOOD=CORRECT ANS
1165  003376  006101                          ROL     GOOD            ;ROTATE NUMBER
1166  003400  103367                          BCC     1$              ;LOOP TILL DONE
```

```
1167                                        ;CAN WE CLEAR THE RSDA REG.
1168  003402  104400                TST17:  SCOPE
1169
1170  003404  012777  177777  175502        MOV     #177777,@RSDA   ;SET RSDA TO ALL ONES
1171  003412  005077  175476                CLR     @RSDA
1172  003416  005777  175472                TST     @RSDA           ;TEST FOR ZERO RSDA
1173  003422  001401                        BEQ     .+4             ;YES
1174  003424  104004                        HLT     !DA             ;ANS SHOULD BE 0
1175  003426  104400                TST20:  SCOPE
1176
1177                                        ;SET AND CLEAR THE RSER REG.
1178
1179  003430  012777  177777  175462        MOV     #177777,@RSER   ;SET THESE BITS
1180  003436  022777  177017  175454        CMP     #177017,@RSER   ;DID THEY SET
1181  003444  001401                        BEQ     .+4             ;YES
1182  003446  104002                        HLT     !ER             ;RSER SHOULD = 157017
1183  003450  112777  000001  175442        MOVB    #1,@RSER        ;A MOVB INST
1184  003456  022777  000001  175434        CMP     #1,@RSER        ;SHOULD MODIFY COMPLETE WD
1185  003464  001401                        BEQ     .+4             ;OK
1186  003466  104002                        HLT     !ER
1187
1188  003470  104400                TST21:  SCOPE
1189
1190  003472  012777  052005  175420        MOV     #52005,@RSER    ;SET THESE BITS
1191  003500  022777  052005  175412        CMP     #52005,@RSER    ;DID THEY SET
1192  003506  001401                        BEQ     .+4             ;YES
1193  003510  104002                        HLT     !ER             ;ER SHOULD = 52005
1194  003512  104400                TST22:  SCOPE
1195
1196  003514  012777  125012  175376        MOV     #125012,@RSER   ;SET THESE BITS
1197  003522  022777  125012  175370        CMP     #125012,@RSER   ;DID THEY SET
1198  003530  001401                        BEQ     .+4             ;YES
1199  003532  104002                        HLT     !ER             ;ER SHOULD = 105012
```

```
1200  003534  104400                    TST23:  SCOPE
1201
1202  003536  012777  177017  175354            MOV     #177017,@RSER   ;SET THESE BITS
1203  003544  005077  175350                    CLR     @RSER           ;CLEAR THEM
1204  003550  005777  175344                    TST     @RSER           ;DID THEY CLEAR
1205  003554  001401                            BEQ     .+4             ;YES
1206  003556  104002                            HLT     !ER             ;SHOULD = 0
1207  003560  104400                    TST24:  SCOPE
1208
1209                                    ;SET AND CLEAR RSMR
1210
1211  003562  012777  000070  175340            MOV     #70,@RSMR       ;SET THESE BITS
1212  003570  017737  175334  001174            MOV     @RSMR,WORK      ;PUT INTO WORKABLE REG
1213  003576  042737  177700  001174            BIC     #177700,WORK    ;CLEAR JUNK
1214  003604  022737  000070  001174            CMP     #70,WORK        ;DID THEY SET
1215  003612  001401                            BEQ     .+4             ;YES
1216  003614  104220                            HLT     !MR             ;SHOULD = 70
1217  003616  104400                    TST25:  SCOPE
1218
1219  003620  012777  000070  175302            MOV     #70,@RSMR       ;SET BITS
1220  003626  005077  175276                    CLR     @RSMR           ;CLEAR THEM
1221  003632  032777  000077  175270            BIT     #77,@RSMR       ;DID THEY CLEAR
1222  003640  001401                            BEQ     .+4             ;YES
1223  003642  104220                            HLT     !MR             ;BITS (77) SHOULD = 0
1224  003644  104400                    TST26:  SCOPE
1225
1226  003646  012777  000050  175254            MOV     #50,@RSMR       ;SET BITS
1227  003654  017737  175250  001174            MOV     @RSMR,WORK      ;PUT IN WORKABLE REG
1228  003662  042737  177700  001174            BIC     #177700,WORK    ;CLEAR JUNK
1229  003670  022737  000050  001174            CMP     #50,WORK        ;DID THESE BITS SET
1230  003676  001401                            BEQ     .+4             ;YES
1231  003700  104220                            HLT     !MR             ;BITS (50) SHOULD BE SET
1232  003702  104400                    TST27:  SCOPE
1233
1234  003704  012777  000020  175216            MOV     #20,@RSMR       ;SET BITS
1235  003712  017737  175212  001174            MOV     @RSMR,WORK      ;PUT INTO WORKABLE REG
1236  003720  042737  177700  001174            BIC     #177700,WORK    ;CLEAR JUNK
1237  003726  022737  000020  001174            CMP     #20,WORK        ;DID THEY SET
1238  003734  001401                            BEQ     .+4             ;YES
1239  003736  104220                            HLT     !MR             ;MR SHOULD AT LEAST HAVE A (21)
```

```
                                ;*****************************************************************************
                                ;TEST 30                    LOAD RANDOM NUMBERS INTO RSWC, RSDA AND RSBA
                                ;*****************************************************************************
003740  104400                  TST30:  SCOPE

003742  012737  001000  001174  RANTS:  MOV     #1000,WORK      ;MAKE TABLE 1000 WDS LONG
003750  012701  027364                  MOV     #OUTBUF,R1      ;GET SRARTING LOC OF TABLE
003754  004537  026634                  JSR     R5,RANDOM       ;GENERATE #
003760  012704  027364                  MOV     #OUTBUF,R4      ;SETUP FOR COMPARE
003764  012737  003772  001010          MOV     #LOP1,LAD       ;SETUP LOOP ADDR
003772  012703  001000          LOP1:   MOV     #1000,R3        ;LOAD TEST COUNTER
003776  005303                  4$:     DEC     R3              ;DONE WITH COMPARE?
004000  001413                          BEQ     1$              ;YES
004002  013705  001110                  MOV     RSWC,R5         ;GET WC ADDRESS
004006  011415                          MOV     (R4),(R5)       ;LOAD WC
004010  021524                          CMP     (R5),(R4)+      ;IS IT CORRECT?
004012  001771                          BEQ     4$              ;YES
004014  017700  175070                  MOV     @RSWC,BAD       ;GET BAD WC
004020  014401                          MOV     -(R4),GOOD      ;GET GOOD ANS
004022  104000                          HLT                     ;TYPE THEM OUT
004024  005724                          TST     (R4)+           ;UPDATE RANDOM NUMBER
004026  000763                          BR      4$              ;CONT
004030  012704  027364          1$:     MOV     #OUTBUF,R4      ;GET STARTING LOC OF TABLE
004034  012737  004042  001010          MOV     #LOP2,LAD       ;SETUP LOOP ADDR
004042  012703  001000          LOP2:   MOV     #1000,R3        ;SETUP TEST COUNTER
004046  005303                  3$:     DEC     R3              ;DONE YET?
004050  001413                          BEQ     1$              ;YES
004052  013705  001114                  MOV     RSDA,R5         ;LOAD DA ADDRESS INTO R5
004056  011415                          MOV     (R4),(R5)       ;LOAD DA
004060  021524                          CMP     (R5),(R4)+      ;IS IT CORRECT?
004062  001771                          BEQ     3$              ;YES
004064  017700  175024                  MOV     @RSDA,BAD       ;GET BAD DATA
004070  014401                          MOV     -(R4),GOOD      ;GET GOOD DATA
004072  104000                          HLT                     ;TYPE IT OUT
004074  005724                          TST     (R4)+           ;UPDATE RANDOM NUMBER
004076  000763                          BR      3$              ;CONTINUE
004100  012704  027364          1$:     MOV     #OUTBUF,R4      ;GET STARTING LOC OF TABLE
004104  012737  004112  001010          MOV     #LOP3,LAD       ;SETUP LOOP ADDR
004112  012703  001000          LOP3:   MOV     #1000,R3        ;SETUP TEST COUNTER
004116  005303                  3$:     DEC     R3              ;DONE YET?
004120  001416                          BEQ     2$              ;YES
004122  013705  001112                  MOV     RSBA,R5         ;LOAD ADDRESS OF BA INTO R5
004126  011415                          MOV     (R4),(R5)       ;LOAD BA
004130  042714  000001                  BIC     #BIT0,(R4)      ;CLEAR BIT 0
004134  021514                          CMP     (R5),(R4)       ;IS IT CORRECT?
004136  001767                          BEQ     3$              ;YES
004140  017700  174746                  MOV     @RSBA,BAD       ;GET BAD DATA
004144  011401                          MOV     (R4),GOOD       ;GET GOOD DATA
004146  104000                          HLT                     ;TYPE IT OUT
004150  000400                          BR      1$              ;GET OUT
004152  005724                  1$:     TST     (R4)+           ;GET NEW NUMBER
004154  000760                          BR      3$              ;CONTINUE
004156  000240                  2$:     NOP
```

```
1293                                    ;*****************************************************************************
1294                                    ;TEST 31                TEST ODD BYTE INSTRUCTIONS ON CS1, CS2, WC AND BA
1295                                    ;*****************************************************************************
1296  004160  104400                    TST31:  SCOPE
1297
1298  004162  104414                    BITST:  CLRDK                           ;CLEAR ALL RS REG
1299  004164  012777  003566  174712            MOV     #3566,@RSCS1            ;LOAD CS1
1300  004172  112777  000005  174740            MOVB    #5,@RSCS1B              ;LOAD BIT
1301  004200  022777  006766  174676            CMP     #6766,@RSCS1            ;DID IT LOAD?
1302  004206  001401                            BEQ     .+4                     ;YES
1303  004210  104001                            HLT     !CS1
1304  004212  112777  000032  174664            MOVB    #32,@RSCS1
1305  004220  022777  006632  174656            CMP     #6632,@RSCS1
1306  004226  001401                            BEQ     .+4
1307  004230  104001                            HLT     !CS1                    ;CS1 SHOULD = 6632
1308
1309  004232  104400                    TST32:  SCOPE
1310
1311  004234  013777  001152  174644    BITCS2: MOV     UNNUM,@RSCS2            ;LOAD UNIT NUMBER
1312  004242  052777  177400  174636            BIS     #177400,@RSCS2          ;LOAD ALL BITS
1313  004250  105077  174666                    CLRB    @RSCS2B                 ;CLR UPPER BYTE
1314  004254  013701  001152                    MOV     UNNUM,GOOD              ;GET UNIT NO.
1315  004260  052701  000100                    BIS     #100,GOOD               ;SET OR BIT
1316  004264  017700  174616                    MOV     @RSCS2,BAD              ;GET CS2
1317  004270  020001                            CMP     BAD,GOOD                ;IS CS2 CORRECT?
1318  004272  001401                            BEQ     .+4                     ;YES
1319  004274  104000                            HLT                             ;LOAD BYTE DID NOT WORK
1320
1321  004276  104400                    TST33:  SCOPE
1322
1323  004300  012777  025252  174602    BITWC:  MOV     #25252,@RSWC            ;LOAD WC
1324  004306  112777  000377  174630            MOVB    #377,@RSWCB             ;LOAD BIT
1325  004314  022777  177652  174566            CMP     #177652,@RSWC           ;DID IT LOAD?
1326  004322  001401                            BEQ     .+4                     ;YES
1327  004324  104010                            HLT     !WC                     ;NO WC SHOULD =177652
1328  004326  112777  000123  174554            MOVB    #123,@RSWC
1329  004334  022777  177523  174546            CMP     #177523,@RSWC
1330  004342  001401                            BEQ     .+4
1331  004344  104010                            HLT     !WC                     ;WC SHOULD = 177523
1332
1333  004346  104400                    TST34:  SCOPE
1334
1335  004350  012777  025252  174534    BITBA:  MOV     #25252,@RSBA            ;LOAB DA
1336  004356  112777  000377  174562            MOVB    #377,@RSBAB             ;LOAD BIT
1337  004364  022777  177652  174520            CMP     #177652,@RSBA           ;DID IT LOAD?
1338  004372  001401                            BEQ     .+4                     ;YES
1339  004374  104020                            HLT     !BA                     ;DA SHOULD =177652
1340  004376  112777  000125  174506            MOVB    #125,@RSBA
1341  004404  022777  177524  174500            CMP     #177524,@RSBA
1342  004412  001401                            BEQ     .+4
1343  004414  104020                            HLT     !BA                     ;BA SHOULD = 177525
1344  004416  104414                            CLRDK                           ;CLEAR ALL RS REG
```

```
                                ;*****************************************************************
                                ;TEST 35                TEST DATA LATE IN CS2
                                ;*****************************************************************
004420  104400                  TST35:  SCOPE

                                ;DO A READ FROM SILO: SHOULD GET DLT + TRE ERROR BECAUSE SILO IS EMPTY

004422  104414                  SILOB:  CLRDK                   ;CLEAR ALL RS REG
004424  017700  174476                  MOV     @FSDB,BAD       ;READ FROM EMPTY SILO
004430  017700  174452                  MOV     @RSCS2,BAD      ;GET CS2
004434  012701  100100                  MOV     #100100,GOOD    ;GET CORRECT ANS
004440  053701  001152                  BIS     UNNUM,GOOD      ;FOR CS2
004444  020001                          CMP     BAD,GOOD        ;IS CS2 CORRECT?
004446  001401                          BEQ     .+4             ;YES
004450  104200                          HLT     !CS2            ;SHOULD HAVE DLT ERROR
004452  022777  144200  174424          CMP     #144200,@RSCS1  ;DID SC AND TRE SET?
004460  001401                          BEQ     .+4             ;YES
004462  104001                          HLT     !CS1            ;SC AND TRE SHOULD BE SET
004464  012777  040000  174412          MOV     #TRE,@RSCS1     ;CLEARS ERROR BIT
004472  032777  140000  174404          BIT     #140000,@RSCS1  ;DID SC + TRE CLEAR
004500  001401                          BEQ     .+4             ;YES
004502  104001                          HLT     !CS1            ;TRE AND SC SHOULD BE 0
004504  017700  174376                  MOV     @RSCS2,BAD      ;GET CS2
004510  042701  100000                  BIC     #BIT15,GOOD     ;GET CORRECT ANS
004514  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT?
004516  001401                          BEQ     .+4             ;YES
004520  104200                          HLT     !CS2            ;DLT SHOULD BE 0
                                ;*****************************************************************
                                ;TEST 36                LOAD RSDB WITH ALL ONES AND ALL ZEROS
                                ;*****************************************************************
004522  104400                  TST36:  SCOPE

004524  104414                  ZERONE: CLRDK                   ;CLEAR ALL RS REG
004526  005077  174374                  CLR     @RSDB           ;LOAD DB WITH ALL 0
004532  012777  177777  174366          MOV     #177777,@RSDB   ;LOAD DB WITH ALL ONES
004540  012737  002000  001174          MOV     #2000,WORK      ;TIME OUT ROUTINE
004546  012701  000300                  MOV     #300,GOOD       ;GET CORRECT FOR CS2
004552  053701  001152                  BIS     UNNUM,GOOD
004556  017700  174324          2$:     MOV     @RSCS2,BAD      ;GET CS2
004562  020100                          CMP     GOOD,BAD        ;IS IT CORRECT?
004564  001404                          BEQ     3$              ;YES
004566  005337  001174                  DEC     WORK            ;TO WAIT FOR OR
004572  001371                          BNE     2$              ;TO SET
004574  104200                          HLT     !CS2            ;OR SHOULD BE SET
004576  005001                  3$:     CLR     GOOD
004600  017700  174322                  MOV     @RSDB,BAD       ;LOAD BAD WITH DB
004604  020100                          CMP     GOOD,BAD        ;IS BAD CORRECT
004606  001401                          BEQ     .+4             ;YES
004610  104000                          HLT                     ;COULD NOT FLOAT 0 THROUGH DB
004612  012701  177777                  MOV     #-1,GOOD        ;LOAD GOOD WITH ANS
004616  017700  174304                  MOV     @RSDB,BAD       ;GET DATA FROM DB
004622  020100                          CMP     GOOD,BAD        ;IS DB CORRECT
004624  001401                          BEQ     .+4             ;YES
004626  104000                          HLT                     ;BAD SHOULD = 1777777
```

```
1399  004630  104400                    TST37:  SCOPE
1400                                    ;TEST FOR 66 LOCATIONS IN SILO PUT COUNT IN EVERY LOCATION
1401
1402  004632  104414                    SILO:   CLRDK                   ;CLEAR ALL RS REG
1403  004634  005001                            CLR     R1              ;CLEAR COUNTER
1404  004636  005201                    1$:     INC     R1              ;INCREMENT COUNTER
1405  004640  010177  174262                   MOV     R1,@RSDB        ;LOAD SILO
1406  004644  022701  000102                   CMP     #66.,R1         ;LAST LOC. YET?
1407  004650  001372                           BNE     1$              ;NO LOOP AGAIN
1408  004652  012701  000200                   MOV     #200,GOOD       ;GET CORRECT ANS FOR CS2
1409  004656  053701  001152                   BIS     UNNUM,GOOD
1410  004662  017700  174220                   MOV     @RSCS2,BAD      ;GET CS2
1411  004666  020100                           CMP     GOOD,BAD        ;IS CS2 CORRECT?
1412  004670  001401                           BEQ     .+4             ;YES
1413  004672  104200                           HLT     !CS2            ;OR SHOULD BE 1
1414  004674  005001                           CLR     GOOD            ;CLEAR LOCATION COUNTER
1415  004676  005201                    2$:     INC     GOOD            ;ADD 1 TO IT
1416  004700  022701  000103                   CMP     #67.,GOOD       ;LAST LOC YET?
1417  004704  001405                           BEQ     3$              ;YES
1418  004706  017700  174214                   MOV     @RSDB,BAD       ;GET LOC FROM DB
1419  004712  020100                           CMP     GOOD,BAD        ;DO LOCATIONS MATCH?
1420  004714  001770                           BEQ     2$              ;YES
1421  004716  104000                           HLT                     ;CAN NOT MATCH 66 LOCATIONS
1422  004720  032777  000200  174160  3$:     BIT     #OR,@RSCS2      ;IS OR 0
1423  004726  001401                           BEQ     .+4             ;YES
1424  004730  104200                           HLT     !CS2            ;OR SHOULD BE 0
1425
1426                                    ;NOW PUT 67 WORDS INTO SILO AND CHECK FOR DLT ERROR
1427
1428  004732  005001                            CLR     R1              ;CLEAR COUNTER
1429  004734  005201                    4$:     INC     R1              ;ADD 1 TO COUNT
1430  004736  010177  174164                   MOV     R1,@RSDB        ;PUT INTO COUNTER
1431  004742  022701  000103                   CMP     #67.,R1         ;DONE YET?
1432  004746  001401                           BEQ     .+4             ;YES
1433  004750  000771                           BR      4$              ;NO DO AGAIN
1434  004752  032777  100000  174126          BIT     #DLT,@RSCS2     ;DID DATA LATE SET?
1435  004760  001001                           BNE     .+4             ;YES
1436  004762  104200                           HLT     !CS2            ;DLT DID NOT SET
1437
1438                                    ;DOES SILO CHANGE WITH 67TH WORD: IT SHOULD NOT
1439
1440  004764  017700  174136                   MOV     @RSDB,BAD       ;GET 1ST WD FORM SILO
1441  004770  012701  000001                   MOV     #1,GOOD         ;CORRECT ANS OF SILO
1442  004774  020100                           CMP     GOOD,BAD        ;IS SILO GOOD
1443  004776  001401                           BEQ     .+4             ;YES
1444  005000  104000                           HLT                     ;SILO SHOULD NOT HAVE MOVED
1445  005002  104400                    TST40:  SCOPE
```

```
                                        ;FLOAT A 1 AND A 0 THROUGH THE SILO

005004  104414          SILOFL: CLRDK                   ;CLEAR ALL RS REG
005006  000241                  CLC                     ;CLEAR CARRY TO FLOAT A 0
005010  012701  000001          MOV     #1,GOOD         ;GET UP DATA FOR INPUT TO SILO
005014  010177  174106  1$:     MOV     GOOD,@RSDB      ;LOAD DB
005020  006101                  ROL     GOOD            ;SHIFT BIT
005022  103401                  BCS     .+4             ;DONE YET SHIFTING?
005024  000773                  BR      1$              ;NO
005026  012701  177776          MOV     #-2,GOOD        ;SET ALL ONES
005032  000261                  SEC                     ;SET CARRY TO ROL
005034  010177  174066  3$:     MOV     GOOD,@RSDB      ;LOAD SILO
005040  006101                  ROL     GOOD            ;SHILT 0
005042  103774                  BCS     3$              ;LOOP TILL DONE

                                        ;NOW TEST OUTPUT

005044  000241                  CLC                     ;CLEAR CARRY
005046  012701  000001          MOV     #1,GOOD         ;CORRECT ANS
005052  017700  174050  2$:     MOV     @RSDB,BAD       ;GET DATA FROM DB
005056  020100                  CMP     GOOD,BAD        ;IS DB DATA GOOD?
005060  001401                  BEQ     .+4             ;YES
005062  104000                  HLT                     ;DB COULD NOT BUBBLE CORRECTLY
005064  006101                  ROL     GOOD            ;SETUP FOR NEXT ANS
005066  103401                  BCS     .+4             ;DONE YET?
005070  000770                  BR      2$              ;NO
005072  012701  177776          MOV     #-2,GOOD        ;SETUP FOR ANS
005076  017700  174024  4$:     MOV     @RSDB,BAD       ;GET DATA FROM DB
005102  020100                  CMP     GOOD,BAD        ;IS IT CORRECT?
005104  001401                  BEQ     .+4             ;YES
005106  104000                  HLT                     ;DB WRONG
005110  000261                  SEC                     ;SET CARRY TO ROL
005112  006101                  ROL     GOOD            ;SETUP FOR NEXT ANS
005114  103770                  BCS     4$              ;LOOP TILL DONE
```

```
                                ;*****************************************************************************
                                ;TEST 41                    TEST NO-OP FUNCTION
                                ;*****************************************************************************
005116  104400                  TST41:  SCOPE

005120  104414                  NOOP:   CLRDK                           ;CLEAR ALL RS REG
005122  012737  177777  027364          MOV     #177777,OUTBUF          ;DATA TO BE XFERED
005130  013777  001102  173754          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
005136  012777  177777  173744          MOV     #-1,@RSWC               ;LOAD WC WITH -1
005144  012777  000001  173732          MOV     #1,@RSCS1               ;DO NO-OP FUNCTION
005152  032777  000001  173724          BIT     #1,@RSCS1               ;DID GO BIT CLEAR
005160  001401                          BEQ     .+4                     ;YES
005162  104001                          HLT     !CS1                    ;GO BIT SHOULD BE CLEARED
005164  005777  173730                  TST     @RSER                   ;DID ANY ERRORS OCCURR?
005170  001401                          BEQ     .+4                     ;NO
005172  104002                          HLT     !ER                     ;ALL ERROR BITS SHOULD BE 0
005174  022777  177777  173706          CMP     #-1,@RSWC               ;DID WC MOVE?
005202  001401                          BEQ     .+4                     ;NO
005204  104010                          HLT     !WC                     ;WC SHOULD = 1777777
005206  005777  173702                  TST     @RSDA                   ;DID DA MOV
005212  001401                          BEQ     .+4                     ;NO
005214  104004                          HLT     !DA                     ;DA SHOULD =0
005216  023777  001102  173666          CMP     @#OBUFSV,@RSBA          ;DID BA MOVE
005224  001401                          BEQ     .+4                     ;NO
005226  104020                          HLT     !BA                     ;BA MOVED
005230  033777  001156  173664          BIT     UNCMP,@RSAS             ;AS SHOULD NOT SET ON
005236  001401                          BEQ     .+4                     ;A NO-OP FUNCTION
005240  104100                          HLT     !AS                     ;AS SET WHY?
```

```
1508
1509                                    ;*****************************************************************************
1510                                    ;TEST 42                TEST NO-OP FUNCTION WITH ERROR BITS SET
1511   005242  104400                   ;*****************************************************************************
1512                                    TST42:  SCOPE
1513   005244  104414                   
1514   005246  012777  000007  173644   NNOOP:  CLRDK                   ;CLEAR ALL RS REG
1515   005254  033777  001156  173640           MOV     #7,@RSER        ;LOAD ER
1516   005262  001001                           BIT     UNCMP,@RSAS     ;IS ATA BIT SET?
1517   005264  104100                           BNE     .+4             ;YES
1518   005266  012737  177777  027364           HLT     !AS             ;AS BIT SHOULD BE SET
1519   005274  013777  001102  173610           MOV     #177777,OUTBUF  ;DATA TO BE XFERED
1520   005302  012777  177777  173600           MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
1521   005310  012777  000001  173566           MOV     #-1,@RSWC       ;LOAD WC WITH -1
1522   005316  032777  000001  173560           MOV     #1,@RSCS1       ;DO NO-OP FUNCTION
1523   005324  001401                           BIT     #1,@RSCS1       ;DID GO BIT CLEAR
1524   005326  104001                           BEQ     .+4             ;YES
1525   005330  022777  150600  173560           HLT     !CS1            ;GO BIT SHOULD BE CLEARED
1526   005336  001401                           CMP     #150600,@RSDS   ;DID ERR BITS SET?
1527   005340  104040                           BEQ     .+4             ;NO
1528   005342  022777  177777  173540           HLT     !DS             ;ERR BIT SHOULD BE 0
1529   005350  001401                           CMP     #-1,@RSWC       ;DID WC MOVE?
1530   005352  104010                           BEQ     .+4             ;NO
1531   005354  005777  173534                   HLT     !WC             ;WC SHOULD = 1777777
1532   005360  001401                           TST     @RSDA           ;DID DA MOV
1533   005362  104004                           BEQ     .+4             ;NO
1534   005364  023777  001102  173520           HLT     !DA             ;DA SHOULD =0
1535   005372  001401                           CMP     @#OBUFSV,@RSBA  ;DID BA MOVE
1536   005374  104020                           BEQ     .+4             ;NO
1537   005376  033777  001156  173516           HLT     !BA             ;BA MOVED
1538   005404  001001                           BIT     UNCMP,@RSAS     ;AS SHOULD BE SET
1539   005406  104100                           BNE     .+4             ;IS IT?
1540   005410  022777  000007  173502           HLT     !AS             ;NO
1541   005416  001401                           CMP     #7,@RSER        ;DID ER CHANGE?
1542   005420  104002                           BEQ     .+4             ;NO
                                                HLT     !ER             ;ER SHOULD NOT CHANGE
```

```
1543                                    ;*****************************************************************************
1544                                    ;TEST 43                TEST NO-OP FUNCTION CODE 21
1545                                    ;*****************************************************************************
1546  005422  104400                    TST43:  SCOPE
1547
1548  005424  104414                    NOOP21: CLRDK                           ;CLEAR ALL RS REG
1549  005426  012737  177777  027364            MOV     #177777,OUTBUF          ;DATA TO BE XFERED
1550  005434  013777  001102  173450            MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
1551  005442  012777  177777  173440            MOV     #-1,@RSWC               ;LOAD WC WITH -1
1552  005450  012777  000021  173426            MOV     #21,@RSCS1              ;DO NO-OP FUNCTION
1553  005456  032777  000001  173420            BIT     #1,@RSCS1               ;DID GO BIT CLEAR
1554  005464  001401                            BEQ     .+4                     ;YES
1555  005466  104001                            HLT     !CS1                    ;GO BIT SHOULD BE CLEARED
1556  005470  005777  173424                    TST     @RSER                   ;DID ANY ERRORS OCCURR?
1557  005474  001401                            BEQ     .+4                     ;NO
1558  005476  104002                            HLT     !ER                     ;ALL ERROR BITS SHOULD BE 0
1559  005500  022777  177777  173402            CMP     #-1,@RSWC               ;DID WC MOVE?
1560  005506  001401                            BEQ     .+4                     ;NO
1561  005510  104010                            HLT     !WC                     ;WC SHOULD = 1777777
1562  005512  005777  173376                    TST     @RSDA                   ;DID DA MOV
1563  005516  001401                            BEQ     .+4                     ;NO
1564  005520  104004                            HLT     !DA                     ;DA SHOULD =0
1565  005522  023777  001102  173362            CMP     @#OBUFSV,@RSBA          ;DID BA MOVE
1566  005530  001401                            BEQ     .+4                     ;NO
1567  005532  104020                            HLT     !BA                     ;BA MOVED
1568  005534  033777  001156  173360            BIT     UNCMP,@RSAS             ;AS SHOULD NOT SET ON
1569  005542  001401                            BEQ     .+4                     ;A NO-OP FUNCTION
1570  005544  104100                            HLT     !AS                     ;AS SET WHY?
1571  005546  022777  004220  173330            CMP     #4220,@RSCS1            ;IS CS1 CORRECT?
1572  005554  001401                            BEQ     .+4                     ;YES
1573  005556  104040                            HLT     !DS                     ;CS1 SHOULD = 4220
```

```
1574                                    ;*************************************************************************
1575                                    ;TEST 44                TEST NO-OP FUNCTION CODE 21 WITH ERROR BITS SET
1576                                    ;*************************************************************************
1577  005560  104400                    TST44:  SCOPE
1578
1579  005562  104414                    NNOP21: CLRDK                           ;CLEAR ALL RS REG
1580  005564  012777  000007  173326            MOV     #7,@RSER                ;LOAD ER
1581  005572  033777  001156  173322            BIT     UNCMP,@RSAS             ;IS ATA BIT SET?
1582  005600  001001                            BNE     .+4                     ;YES
1583  005602  104100                            HLT     !AS                     ;AS BIT SHOULD BE SET
1584  005604  012737  177777  027364            MOV     #177777,OUTBUF          ;DATA TO BE XFERED
1585  005612  013777  001102  173272            MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
1586  005620  012777  177777  173262            MOV     #-1,@RSWC               ;LOAD WC WITH -1
1587  005626  012777  000021  173250            MOV     #21,@RSCS1              ;DO NO-OP FUNCTION
1588  005634  032777  000001  173242            BIT     #1,@RSCS1               ;DID GO BIT CLEAR
1589  005642  001401                            BEQ     .+4                     ;YES
1590  005644  104001                            HLT     !CS1                    ;GO BIT SHOULD BE CLEARED
1591  005646  022777  150600  173242            CMP     #150600,@RSDS           ;DID ERR BITS SET?
1592  005654  001401                            BEQ     .+4                     ;NO
1593  005656  104040                            HLT     !DS                     ;ERR BIT SHOULD BE 0
1594  005660  022777  177777  173222            CMP     #-1,@RSWC               ;DID WC MOVE?
1595  005666  001401                            BEQ     .+4                     ;NO
1596  005670  104010                            HLT     !WC                     ;WC SHOULD = 1777777
1597  005672  005777  173216                    TST     @RSDA                   ;DID DA MOV
1598  005676  001401                            BEQ     .+4                     ;NO
1599  005700  104004                            HLT     !DA                     ;DA SHOULD =0
1600  005702  023777  001102  173202            CMP     @#OBUFSV,@RSBA          ;DID BA MOVE
1601  005710  001401                            BEQ     .+4                     ;NO
1602  005712  104020                            HLT     !BA                     ;BA MOVED
1603  005714  033777  001156  173200            BIT     UNCMP,@RSAS             ;AS SHOULD BE SET
1604  005722  001001                            BNE     .+4                     ;IS IT?
1605  005724  104100                            HLT     !AS                     ;NO
1606  005726  022777  000007  173164            CMP     #7,@RSER                ;DID ER CHANGE?
1607  005734  001401                            BEQ     .+4                     ;NO
1608  005736  104002                            HLT     !ER                     ;ER SHOULD NOT CHANGE
1609  005740  022777  104220  173136            CMP     #104220,@RSCS1          ;IS CS1 CORRECT?
1610  005746  001401                            BEQ     .+4                     ;YES
1611  005750  104040                            HLT     !DS                     ;CS1 SHOULD = 104220
```

```
                                ;*****************************************************************************
                                ;TEST 45                    TEST DRIVE CLEAR FUNCTION WITH ERRORS SET
                                ;*****************************************************************************
005752  104400                  TST45:  SCOPE
                                ;FIRST SET ALL R/W BITS IN DISK REG
                                ;DO DRIVE CLEAR-ALL R/W BITS SHOULD BE CLEARED

005754  104414                  DRCLR:  CLRDK                   ;CLEAR ALL RS REG
005756  012777  177777  173124          MOV     #177777,@RSWC   ;LOAD RSWC
005764  012777  177777  173122          MOV     #177777,@RSDA   ;SET ALL POSSIBLE
005772  012777  177017  173120          MOV     #177017,@RSER   ;BITS IN DISK REG
006000  012777  000070  173122          MOV     #70,@RSMR       ;SET THESE BITS
006006  012777  000011  173070          MOV     #11,@RSCS1      ;SET DRIVE CLEAR
006014  017700  173066                  MOV     @RSCS2,BAD      ;GET CS2 DATA
006020  042700  177640                  BIC     #177640,BAD     ;CLEAR JUNK
006024  013701  001152                  MOV     UNNUM,GOOD      ;GET DRIVE UNIT
006030  052701  000100                  BIS     #100,GOOD       ;SET IR BIT
006034  020100                          CMP     GOOD,BAD        ;IS UNIT # THE SAME
006036  001401                          BEQ     .+4             ;YES
006040  104000                          HLT                     ;UNIT # IN CS2 GOT MODIFIED
006042  005777  173046                  TST     @RSDA           ;DID DA CLEAR
006046  001401                          BEQ     .+4             ;YES
006050  104004                          HLT     !DA             ;DA SHOULD BE 0
006052  005777  173042                  TST     @RSER           ;DID ER CLEAR
006056  001401                          BEQ     .+4             ;YES
006060  104002                          HLT     !ER             ;ER SHOULD BE CLEARED
006062  017737  173042  001174          MOV     @RSMR,WORK      ;GET MR REG
006070  042737  177707  001174          BIC     #177707,WORK    ;CLEAR JUNK
006076  022737  000070  001174          CMP     #70,WORK        ;IS 70 STILL SET IN MR?
006104  001401                          BEQ     .+4             ;YES
006106  104220                          HLT     !MR             ;BITS 70 SHOULD NOT CLEAR
006110  022777  004210  172766          CMP     #4210,@RSCS1    ;DID THESE BITS CLEAR?
006116  001401                          BEQ     .+4             ;YES
006120  104001                          HLT     !CS1            ;CS1 SHOULD =4210
006122  033777  001156  172772          BIT     UNCMP,@RSAS     ;AS SHOULD NOT SET
006130  001401                          BEQ     .+4             ;ON A DRIVE CLEAR FUN
006132  104100                          HLT     !AS             ;WHY DID AS SET?
006134  022777  177777  172746          CMP     #177777,@RSWC   ;DID RSWC CHANGE?
006142  001401                          BEQ     .+4             ;NO
006144  104010                          HLT     !WC
```

```
                                        ;DO ONE WORD WRITE
                                        ;*************************************************************************
                                        ;TEST 46                EXECUTE THE ONE WORD WRITE
                                        ;*************************************************************************
006146  104400                  TST46:  SCOPE

006150  104414                  WRTST:  CLRDK                           ;CLEAR ALL RS REG
006152  012737  177777  027364          MOV     #177777,OUTBUF          ;DATA TO BE X-FERED
006160  013777  001102  172724          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
006166  012777  177777  172714          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
006174  012777  000060  172702  1$:     MOV     #60,@RSCS1              ;SET FUNCTION WITH NO GO BIT
006202  022777  177777  172700          CMP     #-1,@RSWC               ;DID WC MOVE?
006210  001401                          BEQ     .+4                     ;NO
006212  104010                          HLT     !WC                     ;WC MOVED
006214  023777  001102  172670          CMP     @#OBUFSV,@RSBA          ;DID RSBA MOVE?
006222  001401                          BEQ     .+4                     ;NO
006224  104020                          HLT     !BA                     ;BA MOVED
006226  052777  000001  172650          BIS     #BIT0,@RSCS1            ;SET GO BIT
006234  105777  172644          2$:     TSTB    @RSCS1                  ;TEST FOR RDY=0
006240  100001                          BPL     .+4                     ;RDY=0
006242  104001                          HLT     !CS1                    ;RDY SHOULD = 0
006244  004737  026600                  JSR     PC,WAITRY               ;WAIT FOR READY
006250  104001                          HLT     !CS1                    ;SHOULD = 200 RDY NEVER CAME UP
006252  022777  000001  172634          CMP     #1,@RSDA                ;IS RSDA CORRECT
006260  001401                          BEQ     .+4                     ;RSDA OK
006262  104004                          HLT     !DA                     ;SHOULD = 1 SHOULD INCREMENT
006264  022777  004200  172612  3$:     CMP     #4200,@RSCS1            ;IS ERROR FLAG SET?
006272  001401                          BEQ     .+4                     ;NO! X-FER OK
006274  104047                          HLT     !CS1!ER!DS!DA           ;ERROR DURING X-FER
006276  005777  172606          4$:     TST     @RSWC                   ;FETCH WORD COUNT
006302  001401                          BEQ     .+4                     ;WORD COUNT DID OVERFLOW
006304  104010                          HLT     !WC                     ;SHOULD = 0 FAILED TO INCREMENT
006306  022777  010600  172602          CMP     #10600,@RSDS            ;IS RSDS OK?
006314  001401                          BEQ     .+4                     ;YES
006316  104044                          HLT     !DS!DA                  ;NO
006320  013701  001152                  MOV     UNNUM,GOOD              ;GET UNIT #
006324  052701  000100                  BIS     #100,GOOD               ;SET IR BIT
006330  017700  172552                  MOV     @RSCS2,BAD              ;GET CS2
006334  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
006336  001401                          BEQ     .+4                     ;YES
006340  104000                          HLT                             ;BAD = CS2 GOOD IS CORRECT ANS
006342  017700  172544                  MOV     @RSBA,BAD               ;GET BA DATA
006346  013701  001102                  MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD EQUAL
006352  062701  000002                  ADD     #2,GOOD                 ;UPDATE OUTBUFFER
006356  020100                          CMP     GOOD,BAD                ;IS RSBA CORRECT
006360  001401                          BEQ     .+4                     ;YES
006362  104000                          HLT                             ;BA FAILED TO INCREMENT
006364  005777  172530                  TST     @RSER                   ;DID ANY ERRORS SET?
006370  001401                          BEQ     .+4                     ;NO
006372  104040                          HLT     !DS
```

```
                                        ;TEST READ FUNCTION
                                        ;
                                        ;*************************************************************************
                                        ;TEST 47                    EXECUTE THE ONE WORD READ
                                        ;*************************************************************************
006374  104400                  TST47:  SCOPE
                                        ;
006376  104414                  RDTST:  CLRDK                           ;CLEAR ALL RS REG
006400  005037  027364                  CLR     OUTBUF                  ;CLR TO READ INTO
006404  013777  001102  172500          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
006412  012777  177777  172470          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
006420  012777  000071  172456  1$:     MOV     #71,@RSCS1              ;GO READ
006426  105777  172452          2$:     TSTB    @RSCS1                  ;TEST FOR BUSY=1
006432  100001                          BPL     .+4                     ;BUSY SET
006434  104001                          HLT     !CS1                    ;BUSY NOT SET
006436  004737  026600                  JSR     PC,WAITRY               ;WAIT FOR READY
006442  104001                          HLT     !CS1                    ;TIMEOUT RDY DID NOT SET
006444  022777  000001  172442          CMP     #BIT0,@RSDA             ;WAS RSDA INCREMENTED BY 1
006452  001401                          BEQ     .+4                     ;RSDA OK
006454  104046                          HLT     !DA!ER!DS               ;RSDA SHOULD CONTAIN A 1
006456  022777  004270  172420  3$:     CMP     #4270,@RSCS1            ;IS ERROR FLAG SET?
006464  001401                          BEQ     .+4                     ;NO! X-FER OK
006466  104043                          HLT     !CS1!ER!DS              ;RSCS1 SHOULD = 270
006470  005777  172414          4$:     TST     @RSWC                   ;TEST WC
006474  001401                          BEQ     .+4                     ;WORD COUNT DID OVERFLOW
006476  104010                          HLT     !WC                     ;SHOULD = 0
006500  013701  001152                  MOV     UNNUM,GOOD              ;GET CORRECT
006504  052701  000100                  BIS     #100,GOOD               ;ANS OF CS2
006510  017700  172372                  MOV     @RSCS2,BAD              ;GET CS2
006514  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
006516  001401                          BEQ     .+4                     ;YES
006520  104000                          HLT                             ;GOOD = CORRECT ANS FOR CS2
006522  017700  172364                  MOV     @RSBA,BAD               ;FETCH CURRENT ADDRESS
006526  013701  001102                  MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD EQUAL
006532  062701  000002                  ADD     #2,GOOD                 ;UPDATE IT
006536  020001                          CMP     BAD,GOOD                ;IS RSBA CORRECT
006540  001401                          BEQ     .+4                     ;YES EXECUTE CONTINUE
006542  104000                          HLT                             ;RSBA FAILED TO INCREMENT
006544  013700  027364                  MOV     OUTBUF,BAD              ;GET DATA READ FROM DISK
006550  012701  177777                  MOV     #-1,GOOD                ;GET CORRECT ANS
006554  020100                          CMP     GOOD,BAD                ;IS OUTBUF CORRECT
006556  001401                          BEQ     .+4                     ;YES
006560  104000                          HLT                             ;GOOD=CORRECT ANS BAD=DATA READ FROM DISK
```

```
                                ;*******************************************************************************
                                ;TEST 50                    TEST WRITE CHECK
                                ;*******************************************************************************
006562  104400                  TST50:  SCOPE
                                ;DO A ONE WORD WRITE CHECK

                                ;* * *EXECUTE THE ONE WORD WRITE CHECK* * *

006564  104414                  WRCKT:  CLRDK                   ;CLEAR ALL RS REG
006566  012737  177777  027364          MOV     #177777,OUTBUF  ;DATA TO BE X-FERED
006574  013777  001102  172310          MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
006602  012777  177777  172300          MOV     #-1,@RSWC       ;SET WORD COUNT TO -1
006610  012777  000051  172266  1$:     MOV     #51,@RSCS1      ;GO WRITE CHECK
006616  105777  172262          2$:     TSTB    @RSCS1          ;TEST FOR READY
006622  100001                          BPL     .+4             ;NOT READY
006624  104001                          HLT     !CS1            ;BUSY FAILED TO SET
006626  004737  026600          RSWCWT: JSR     PC,WAITRY       ;WAIT FOR READY
006632  104001                          HLT     !CS1            ;BUSY FAILED TO CLEAR
006634  013701  001152                  MOV     UNNUM,GOOD      ;GET UNIT #
006640  052701  000100                  BIS     #100,GOOD       ;SET BIT IR
006644  017700  172236                  MOV     @RSCS2,BAD      ;GET CS2
006650  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT?
006652  001401                          BEQ     .+4             ;YES
006654  104000                          HLT                     ;GOOD = CORRECT ANS FOR CS2
006656  022777  004250  172220  2$:     CMP     #4250,@RSCS1    ;ANY ERRORS?
006664  001401                          BEQ     .+4             ;X-FER OK
006666  104046                          HLT     !DA!ER!DS       ;ERROR DUR X-FER
006670  022777  000001  172216  3$:     CMP     #BIT0,@RSDA     ;WAS DAR INCREMENTED BY 1
006676  001401                          BEQ     .+4             ;RSDA OK
006700  104004                          HLT     !DA             ;DAR SHOULD = 1
006702  005777  172202                  TST     @RSWC           ;TEST FOR OVERFLOW
006706  001401                          BEQ     .+4             ;WORD COUNT DID OVERFLOW
006710  104010                          HLT     !WC             ;SHOULD = 0
006712  017700  172174                  MOV     @RSBA,BAD       ;FETCH CURRENT ADDRESS
006716  013701  001102                  MOV     @#OBUFSV,GOOD   ;WHAT RSBA SHOULD EQUAL
006722  062701  000002                  ADD     #2,GOOD         ;UPDATE IT
006726  020001                          CMP     BAD,GOOD        ;IS RSBA CORRECT
006730  001401                          BEQ     .+4             ;YES EXECUTE CONTINUE
006732  104000                          HLT                     ;RSBA FAILED TO INCREMENT
```

```
                                ;DO ONE WORD WRITE ON -B- PORT
                                ;IF A 1 WD TRANSFER KEEPS SETTING NEM PROGAM WILL GO AND UPDATE
                                ;ADDRESS (OBUFSV) ON -B- PORT BY 4K AND TRY TRANSFER AGAIN UNTILL IT
                                ;REACHES 28K. IF NO TRANSFER IT THEN SKIPS WRITE,
                                ;READ AND WRITE CHECK ON -B- PORT
                                ;TO INHIBIT OBUFSV FROM CHANGING SET BIT 12

                                ;*************************************************************************
                                ;TEST 51                 EXECUTE THE ONE WORD WRITE ON -B- PORT
                                ;*************************************************************************
006734  104400                  TST51:  SCOPE

006736  104414                  WRTSTB: CLRDK                           ;CLEAR ALL RS REG
006740  013737  001102  001174          MOV     @#OBUFSV,WORK           ;GET LOC OF RSBA TO LOAD
006746  012777  177777  172220          MOV     #177777,@WORK           ;DATA TO BE X-FERED
006754  013777  001102  172130          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
006762  012777  177777  172120          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
006770  012777  002061  172106          MOV     #2061,@RSCS1            ;TEST B PORT
006776  105777  172102          2$:     TSTB    @RSCS1                  ;TEST FOR RDY=0
007002  100001                          BPL     .+4                     ;RDY=0
007004  104001                          HLT     !CS1                    ;RDY SHOULD = 0
007006  004737  026600                  JSR     PC,WAITRY               ;WAIT FOR READY
007012  104001                          HLT     !CS1                    ;SHOULD = 260 RDY NEVER CAME UP
007014  032777  010000  172004          BIT     #BIT12,@SWR             ;INHIBIT ADDRESS?
007022  001006                          BNE     3$                      ;YES
007024  032777  004000  172054          BIT     #BIT11,@RSCS2           ;DID NEM SET?
007032  001402                          BEQ     3$                      ;NO
007034  000137  025632                  JMP     FINDM                   ;GO FIND MEMORY ON PORT B
007040  022777  000001  172046  3$:     CMP     #1,@RSDA                ;IS RSDA CORRECT
007046  001401                          BEQ     .+4                     ;RSDA OK
007050  104004                          HLT     !DA                     ;SHOULD = 1 SHOULD INCREMENT
007052  022777  006260  172024          CMP     #6260,@RSCS1            ;IS CS1 CORRECT?
007060  001401                          BEQ     4$                      ;YES
007062  104001                          HLT     !CS1
007064  005777  172020          4$:     TST     @RSWC                   ;FETCH WORD COUNT
007070  001401                          BEQ     .+4                     ;WORD COUNT DID OVERFLOW
007072  104010                          HLT     !WC                     ;SHOULD = 0 FAILED TO INCREMENT
007074  022777  010600  172014          CMP     #10600,@RSDS            ;IS RSDS OK?
007102  001401                          BEQ     .+4                     ;YES
007104  104044                          HLT     !DS!DA                  ;NO
007106  013701  001152                  MOV     UNNUM,GOOD              ;GET UNIT #
007112  052701  000100                  BIS     #100,GOOD               ;SET IR BIT
007116  017700  171764                  MOV     @RSCS2,BAD              ;GET CS2
007122  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
007124  001401                          BEQ     .+4                     ;YES
007126  104000                          HLT                             ;BAD = CS2 GOOD IS CORRECT ANS
007130  017700  171756                  MOV     @RSBA,BAD               ;GET BA DATA
007134  013701  001102                  MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD EQUAL
007140  062701  000002                  ADD     #2,GOOD                 ;UPDATE OUTBUFFER
007144  020100                          CMP     GOOD,BAD                ;IS RSBA CORRECT
007146  001401                          BEQ     .+4                     ;YES
007150  104000                          HLT                             ;BA FAILED TO INCREMENT
```

```
1836
1837                                    ;*****************************************************************************
1838                                    ;TEST 52                    EXECUTE THE ONE WORD READ ON -B- PORT
1839                                    ;*****************************************************************************
1840   007152  104400                   TST52:  SCOPE
1841
1842   007154  104414                   RDTSTB: CLRDK                           ;CLEAR ALL RS REG
1843   007156  005037  001174                   CLR     WORK                    ;CLR TO READ INTO
1844   007162  013777  001102  171722           MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
1845   007170  012777  177777  171712           MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
1846   007176  012777  002071  171700           MOV     #2071,@RSCS1            ;B PORT
1847   007204  105777  171674           2$:     TSTB    @RSCS1                  ;TEST FOR BUSY=1
1848   007210  100001                           BPL     .+4                     ;BUSY SET
1849   007212  104001                           HLT     !CS1                    ;BUSY NOT SET
1850   007214  004737  026600                   JSR     PC,WAITRY               ;WAIT FOR READY
1851   007220  104001                           HLT     !CS1                    ;TIMEOUT RDY DID NOT SET
1852   007222  022777  000001  171664           CMP     #BIT0,@RSDA             ;WAS RSDA INCREMENTED BY 1
1853   007230  001401                           BEQ     .+4                     ;RSDA OK
1854   007232  104046                           HLT     !DA!ER!DS               ;RSDA SHOULD CONTAIN A 1
1855   007234  022777  006270  171642           CMP     #6270,@RSCS1            ;TST B PORT
1856   007242  001401                           BEQ     4$                      ;OK
1857   007244  104001                           HLT     !CS1                    ;CS1 SHOULD = 6270
1858   007246  005777  171636           4$:     TST     @RSWC                   ;TEST WC
1859   007252  001401                           BEQ     .+4                     ;WORD COUNT DID OVERFLOW
1860   007254  104010                           HLT     !WC                     ;SHOULD = 0
1861   007256  013701  001152                   MOV     UNNUM,GOOD              ;GET CORRECT
1862   007262  052701  000100                   BIS     #100,GOOD               ;ANS OF CS2
1863   007266  017700  171614                   MOV     @RSCS2,BAD              ;GET CS2
1864   007272  020100                           CMP     GOOD,BAD                ;IS CS2 CORRECT?
1865   007274  001401                           BEQ     .+4                     ;YES
1866   007276  104000                           HLT                             ;GOOD = CORRECT ANS FOR CS2
1867   007300  017700  171606                   MOV     @RSBA,BAD               ;FETCH CURRENT ADDRESS
1868   007304  013701  001102                   MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD EQUAL
1869   007310  062701  000002                   ADD     #2,GOOD                 ;UPDATE IT
1870   007314  020001                           CMP     BAD,GOOD                ;IS RSBA CORRECT
1871   007316  001401                           BEQ     .+4                     ;YES EXECUTE CONTINUE
1872   007320  104000                           HLT                             ;RSBA FAILED TO INCREMENT
1873   007322  013737  001102  001174           MOV     @#OBUFSV,WORK           ;GET DATA READ FROM DISK
1874   007330  017700  171640                   MOV     @WORK,BAD
1875   007334  012701  177777                   MOV     #-1,GOOD                ;GET CORRECT ANS
1876   007340  020100                           CMP     GOOD,BAD                ;IS OUTBUF CORRECT
1877   007342  001401                           BEQ     .+4                     ;YES
1878   007344  104000                           HLT                             ;GOOD=CORRECT ANS BAD=DATA READ FROM DISK
```

```
                                ;*****************************************************************************
                                ;TEST 53                    TEST WRITE CHECK ON -B- PORT
                                ;*****************************************************************************
007346  104400                  TST53:  SCOPE

007350  104414                  WRCKTB: CLRDK                           ;CLEAR ALL RS REG
007352  013737  001102  001174          MOV     @#OBUFSV,WORK           ;GET LOC FOR
007360  012777  177777  171606          MOV     #177777,@WORK           ;DATA TO BE X-FERED
007366  013777  001102  171516          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
007374  012777  177777  171506          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
007402  012777  002051  171474          MOV     #2051,@RSCS1            ;B PORT
007410  105777  171470          2$:     TSTB    @RSCS1                  ;TEST FOR READY
007414  100001                          BPL     .+4                     ;NOT READY
007416  104001                          HLT     !CS1                    ;BUSY FAILED TO SET
007420  004737  006600                  JSR     PC,WAITRY               ;WAIT FOR READY
007424  104001                          HLT     !CS1                    ;BUSY FAILED TO CLEAR
007426  013701  001152                  MOV     UNNUM,GOOD              ;GET UNIT #
007432  052701  000100                  BIS     #100,GOOD               ;SET BIT IR
007436  017700  171444                  MOV     @RSCS2,BAD              ;GET CS2
007442  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
007444  001401                          BEQ     .+4                     ;YES
007446  104000                          HLT                             ;GOOD = CORRECT ANS FOR CS2
007450  022777  006250  171426          CMP     #6250,@RSCS1            ;IS CS1 CORRECT?
007456  001401                          BEQ     3$                      ;YES
007460  104001                          HLT     !CS1                    ;CS1 SHOULD = 6250
007462  022777  000001  171424  3$:     CMP     #BIT0,@RSDA             ;WAS DAR INCREMENTED BY 1
007470  001401                          BEQ     .+4                     ;RSDA OK
007472  104004                          HLT     !DA                     ;DAR SHOULD = 1
007474  005777  171410                  TST     @RSWC                   ;TEST FOR OVERFLOW
007500  001401                          BEQ     .+4                     ;WORD COUNT DID OVERFLOW
007502  104010                          HLT     !WC                     ;SHOULD = 0
007504  017700  171402                  MOV     @RSBA,BAD               ;FETCH CURRENT ADDRESS
007510  013701  001102                  MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD EQUAL
007514  062701  000002                  ADD     #2,GOOD                 ;UPDATE IT
007520  020001                          CMP     BAD,GOOD                ;IS RSBA CORRECT
007522  001401                          BEQ     .+4                     ;YES EXECUTE CONTINUE
007524  104000                          HLT                             ;RSBA FAILED TO INCREMENT
```

```
1916  007526  013737  001102  001170  NXM:    MOV     OBUFSV,BPORTT   ;SAVE -B- PORT BUFFER
1917  007534  012737  027364  001102          MOV     #OUTBUF,OBUFSV  ;RESTORE OBUFSV
1918
1919                                  ;DESELECT THEN SELECT UNIT NUMBER IN RSCS2 CHECK TIMING
1920                                  ;*************************************************************************
1921                                  ;TEST 54                    DESELECT THEN SELECT UNIT NUMBER TIMING TEST
1922                                  ;*************************************************************************
1923  007542  104400                  TST54:  SCOPE
1924
1925  007544  104414                  UNITST: CLRDK                           ;CLEAR ALL RS REG
1926  007546  005004                          CLR     R4                      ;CLEAR R4
1927  007550  020437  001152                  CMP     R4,UNNUM                ;IS THIS CORRECT UNIT #?
1928  007554  001001                          BNE     3$                      ;NO THEN USE IT
1929  007556  005204                          INC     R4                      ;GET WRONG DRIVE
1930  007560  012737  177777  027364  3$:     MOV     #177777,OUTBUF          ;DATA TO BE X-FERED
1931  007566  013777  001102  171316          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
1932  007574  012777  177777  171306          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
1933  007602  012703  000061                  MOV     #61,R3                  ;GET WRITE FUNCTION
1934  007606  013705  001152                  MOV     UNNUM,R5                ;GET CORRECT UNIT #
1935  007612  012701  172040                  MOV     #172040,R1              ;GET CS1 REG
1936  007616  010461  000010                  MOV     R4,10(R1)               ;LOAD WRONG UNIT # INTO CS2
1937  007622  000240                          NOP                             ;WAIT FOR DRIVE TO SETTLE
1938  007624  010561  000010                  MOV     R5,10(R1)               ;LOAD CORRECT UNIT #
1939  007630  010311                  1$:     MOV     R3,(R1)                 ;LOAD FUNCTION IN CS1
1940  007632  004737  026600                  JSR     PC,WAITRY               ;WAIT FOR READY
1941  007636  104001                          HLT     !CS1                    ;SHOULD = 260 RDY NEVER CAME UP
1942  007640  022777  004260  171236          CMP     #4260,@RSCS1            ;IS ERROR FLAG SET?
1943  007646  001401                          BEQ     .+4                     ;NO! X-FER OK
1944  007650  104047                          HLT     !CS1!ER!DS!DA           ;ERROR DURING X-FER
1945  007652  022777  000001  171234          CMP     #1,@RSDA                ;IS RSDA CORRECT
1946  007660  001401                          BEQ     .+4                     ;RSDA OK
1947  007662  104004                          HLT     !DA                     ;SHOULD = 1 SHOULD INCREMENT
1948  007664  005777  171220                  TST     @RSWC                   ;FETCH WORD COUNT
1949  007670  001401                          BEQ     .+4                     ;WORD COUNT DID OVERFLOW
1950  007672  104010                          HLT     !WC                     ;SHOULD = 0 FAILED TO INCREMENT
1951  007674  022777  010600  171214          CMP     #10600,@RSDS            ;IS RSDS OK?
1952  007702  001401                          BEQ     .+4                     ;YES
1953  007704  104044                          HLT     !DS!DA                  ;NO
1954  007706  013701  001152                  MOV     UNNUM,GOOD              ;GET UNIT #
1955  007712  052701  000100                  BIS     #100,GOOD               ;SET IR BIT
1956  007716  017700  171164                  MOV     @RSCS2,BAD              ;GET CS2
1957  007722  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
1958  007724  001401                          BEQ     .+4                     ;YES
1959  007726  104000                          HLT                             ;BAD = CS2 GOOD IS CORRECT ANS
1960  007730  017700  171156                  MOV     @RSBA,BAD               ;GET BA DATA
1961  007734  013701  001102                  MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD EQUAL
1962  007740  062701  000002                  ADD     #2,GOOD                 ;UPDATE OUTBUFFER
1963  007744  020100                          CMP     GOOD,BAD                ;IS RSBA CORRECT
1964  007746  001401                          BEQ     .+4                     ;YES
1965  007750  104000                          HLT                             ;BA FAILED TO INCREMENT
```

```
                                        ;TEST CURRENT ADDRESS INHIBT-BAI IN RSCS2
                                        ;DO A ONE WORD WRITE AND SEE
                                        ;IF RSBA INCREMENTED AFTER THE X-FER
                                        ;
                                        ;*************************************************************************
                                        ;TEST 55                    TEST BAI IN RSCS2
                                        ;*************************************************************************
007752  104400                          TST55:  SCOPE
                                        ;
007754  104414                          BAITST: CLRDK                           ;CLEAR ALL RS REG
007756  013777  001102  171126                  MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDR
007764  012777  177777  171116                  MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
007772  052777  000010  171106                  BIS     #BAI,@RSCS2             ;SET BAI BIT
010000  012777  000061  171076                  MOV     #61,@RSCS1              ;WRITE
010006  004737  026600                          JSR     PC,WAITRY               ;WAIT FOR READY
010012  104001                                  HLT     !CS1                    ;RDY DID NOT SET
010014  013701  001102                  1$:     MOV     @#OBUFSV,GOOD           ;WHAT RSBA SHOULD BE
010020  017700  171066                          MOV     @RSBA,BAD               ;WHAT RSBA IS
010024  020100                                  CMP     GOOD,BAD                ;COMPARE
010026  001401                                  BEQ     .+4                     ;YES
010030  104000                                  HLT                             ;BAD=OUTBUF GOOD = CORRECT ANS
010032  005777  171062                          TST     @RSER                   ;ANY ERRORS?
010036  001401                                  BEQ     .+4                     ;NO
010040  104040                                  HLT     !DS                     ;YES
010042  104414                                  CLRDK                           ;CLEAR ALL RS REG
010044  032777  000010  171034                  BIT     #BAI,@RSCS2             ;DID BAI CLEAR?
010052  001401                                  BEQ     .+4                     ;YES
010054  104002                                  HLT     !ER                     ;BAI DID NOT SET
```

```
                                ;*****************************************************************************
                                ;TEST 56                    TEST NON-EXISTENT MEMORY ERROR BIT IN CS2
                                ;*****************************************************************************
010056  104400                  TST56:  SCOPE

010060  104414                  NXMTSM: CLRDK                           ;CLEAR ALL RS REG
010062  052777  000010  171016          BIS     #BAI,@RSCS2             ;SET BAI BIT
010070  012777  177600  171012          MOV     #-200,@RSWC             ;SET UP WORD COUNT
010076  012777  173000  171006          MOV     #173000,@RSBA           ;SET UP CURRENT ADDRESS
010104  012777  001471  170772          MOV     #1471,@RSCS1            ;READ AND LOAD A16 +A17 FOR 18 BIT ADDRESS
010112  004737  026600                  JSR     PC,WAITRY               ;WAIT FOR READY
010116  104040                          HLT     !DS                     ;READY NEVER CAME UP
010120  013701  001152          TSTNEM: MOV     UNNUM,GOOD              ;GET UNIT NO.
010124  052701  004310                  BIS     #4310,GOOD              ;SET BAI+OR BITS
010130  017700  170752                  MOV     @RSCS2,BAD              ;GET CS2
010134  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
010136  001401                          BEQ     .+4                     ;YES
010140  104000                          HLT                             ;BAD=CS2 GOOD=CORRECT ANS FOR CS2
010142  022777  145670  170734          CMP     #145670,@RSCS1          ;DID TRE SET?
010150  001401                          BEQ     .+4                     ;YES
010152  104001                          HLT     !CS1                    ;TRE SHOULD SET BECAUSE OF NEM
010154  012777  040000  170722          MOV     #TRE,@RSCS1             ;CLEAR TRE
010162  017700  170720                  MOV     @RSCS2,BAD              ;GET CS2
010166  013701  001152                  MOV     UNNUM,GOOD              ;GET DRIVE
010172  052701  000310                  BIS     #310,GOOD               ;SET IR
010176  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
010200  001401                          BEQ     .+4                     ;YES
010202  104200                          HLT     !CS2                    ;CS2=BAD GOOD IS CORRECT ANS FOR CS2

                                ;*****************************************************************************
                                ;TEST 57                    TEST BLOCK SEARCH FUNCTION, PIP AND DRY BIT AND ADDR. CONF BIT
                                ;*****************************************************************************
010204  104400                  TST57:  SCOPE

010206  104414                  BLOCK:  CLRDK                           ;CLEAR ALL RS REG
010210  012777  000032  170676          MOV     #32,@RSDA               ;DO A SEARCH FOR SECTOR 32
010216  013777  001102  170666          MOV     @#OBUFSV,@RSBA          ;LOAD REGS. TO MAKE
010224  012777  177777  170656          MOV     #-1,@RSWC               ;SURE THEY DO NOT CHANGE
010232  005037  001174                  CLR     WORK                    ;SETUP FOR TIMEOUT ROUTINE
010236  032777  001000  170664  4$:     BIT     #1000,@RSMR             ;WAIT FOR DISK TO
010244  001004                          BNE     3$                      ;REACH SECTOR 32
010246  005337  001174                  DEC     WORK                    ;TIME OUT
010252  001371                          BNE     4$                      ;ROUTINE
010254  104220                          HLT     !MR                     ;COULD NOT FIND SECTOR 32
```

```
2038  010256  005077  170632            3$:   CLR   @RSDA          ;NOW SEARCH FOR 0
2039  010262  012777  000031  170614          MOV   #31,@RSCS1      ;DO A BLOCK SEARCH FUNCTION
2040  010270  032777  000200  170620          BIT   #DRY,@RSDS      ;IS DRY CLEARED?
2041  010276  001402                          BEQ   1$              ;YES
2042  010300  104040                          HLT   !DS             ;DRY SHOULD BE CLEARED DURING A BLOCK SEARCH
2043  010302  000500                          BR    OOUT            ;GET OUT BECAUSE OF TIMING
2044  010304  032777  020000  170604    1$:   BIT   #20000,@RSDS     ;IS PIP SET?
2045  010312  001001                          BNE   .+4             ;YES
2046  010314  104040                          HLT   !DS             ;PIP SHOULD BE SET
2047  010316  012701  020000                  MOV   #20000,GOOD     ;SETUP FOR TIMEOUT ROUTINE
2048  010322  005301                    2$:   DEC   GOOD            ;DO TIMEOUT
2049  010324  001466                          BEQ   TTMOUT          ;TIMED OUT
2050  010326  032777  000200  170562          BIT   #DRY,@RSDS      ;DID DRY SET?
2051  010334  001772                          BEQ   2$              ;NO
2052  010336  022777  110600  170552          CMP   #110600,@RSDS   ;DID PIP CLEAR?
2053  010344  001401                          BEQ   .+4             ;YES
2054  010346  104040                          HLT   !DS             ;PIP BIT DID NOT CLEAR
2055  010350  022777  104230  170526          CMP   #104230,@RSCS1  ;DID SC SET?
2056  010356  001401                          BEQ   .+4             ;YES
2057  010360  104041                          HLT   !CS1!DS         ;SC DID NOT SET
2058  010362  013737  001152  001174          MOV   UNNUM,WORK      ;GET CORRECT AS BIT
2059  010370  005001                          CLR   GOOD            ;IN RSAS REG
2060  010372  000261                          SEC                   ;THAT SHOULD
2061  010374  006101                    5$:   ROL   GOOD            ;BE SET
2062  010376  005737  001174                  TST   WORK
2063  010402  001403                          BEQ   6$
2064  010404  005337  001174                  DEC   WORK
2065  010410  000771                          BR    5$
2066  010412  020177  170504            6$:   CMP   GOOD,@RSAS      ;IS RSAS CORRECT?
2067  010416  001403                          BEQ   7$              ;YES
2068  010420  017700  170476                  MOV   @RSAS,BAD       ;NO
2069  010424  104000                          HLT
2070  010426  010177  170470            7$:   MOV   GOOD,@RSAS      ;CLEAR AS REG
2071  010432  005777  170464                  TST   @RSAS           ;DID IT CLEAR?
2072  010436  001401                          BEQ   .+4             ;YES
2073  010440  104100                          HLT   !AS             ;NO
2074  010442  022777  010600  170446          CMP   #10600,@RSDS    ;DID ATA CLEAR?
2075  010450  001401                          BEQ   .+4             ;YES
2076  010452  104040                          HLT   !DS             ;NO
2077  010454  023777  001102  170430          CMP   @#OBUFSV,@RSBA  ;DID BA MOVE?
2078  010462  001401                          BEQ   .+4             ;NO
2079  010464  104021                          HLT   !CS1!BA         ;BA MOVED WHY?
2080  010466  022777  177777  170414          CMP   #-1,@RSWC       ;DID WC MOVE?
2081  010474  001401                          BEQ   .+4             ;NO
2082  010476  104010                          HLT   !WC             ;WC MOVED WHY?
2083  010500  000401                          BR    OOUT            ;DONE GET OUT
2084  010502  104040                  TTMOUT: HLT   !DS             ;DYR NEVER CAME UP
2085  010504                          OOUT:                         ;DONE
```

```
                                ;##########################################################################
                                ;TEST 60                ILLEGAL FUNCTION CODE TEST CODE 3 TO 51
                                ;##########################################################################
010504  104400                  TST60:  SCOPE

                                ;TEST ILF BIT IN RSER AND ERR BIT IN RSDS
                                ;ALSO CHECKS TO SEE IF WC,BA, OR DA GOT MODIFIED
                                ;IF WISHING TO LOOP ON ONE FUNCTION ONLY, LOAD
                                ;FUNCTION INTO LOCATION ILLTAB: AND 0 IN FOLLOWING LOCATION

010506  013737  022414  001164  ILL51:  MOV     TIMES,TIMSV     ;SAVE LOOP COUNT
010514  012737  000010  022414           MOV     #10,TIMES       ;LOOP TEN TIMES
010522  104414                           CLRDK                   ;CLEAR ALL RS REG
010524  012703  027300           1$:     MOV     #ILLTAB,R3      ;GET STARTING ADD OF TABLE
010530  012300                   3$:     MOV     (R3)+,BAD       ;GET ILL FUN
010532  001513                           BEQ     ILFDN           ;DONE GET OUT
010534  013777  001102  170350           MOV     @#OBUFSV,@RSBA  ;SET UP REGS.
010542  012777  177777  170340           MOV     #-1,@RSWC       ;TO CHECK FOR CHANGE
010550  010077  170330           2$:     MOV     BAD,@RSCS1      ;DO ILLEGAL FUNCTION
010554  042700  000001                   BIC     #BIT0,BAD       ;CLEAR GO BIT
010560  010001                           MOV     BAD,GOOD        ;MOV ILLEGAL FUN INTO GOOD
010562  105777  170316           6$:     TSTB    @RSCS1          ;RDY SET?
010566  100375                           BPL     6$              ;NO
010570  052701  104200                   BIS     #104200,GOOD    ;SET ERROR BITS
010574  017700  170304           4$:     MOV     @RSCS1,BAD      ;PUT CS1 INTO BAD
010600  020100                           CMP     GOOD,BAD        ;IS CS1 CORRECT?
010602  001401                           BEQ     .+4             ;YES
010604  104000                           HLT                     ;GOOD IS WHAT CS1 SHOULD =BAD=CS1
010606  022777  000001  170304           CMP     #1,@RSER        ;DID ILF SET?
010614  001401                           BEQ     .+4             ;YES
010616  104043                           HLT     !CS1!ER!DS      ;ILF DID NOT SET
010620  022777  150600  170270           CMP     #150600,@RSDS   ;IS DS GOOD?
010626  001401                           BEQ     .+4             ;YES
010630  104043                           HLT     !CS1!ER!DS      ;ERR DID NOT SET
010632  017700  170250                   MOV     @RSCS2,BAD      ;GET CS2
010636  013701  001152                   MOV     UNNUM,GOOD      ;GET UNIT #
010642  052701  000100                   BIS     #100,GOOD       ;SET IR BIT
010646  020100                           CMP     GOOD,BAD        ;IS CS2 CORRECT?
010650  001401                           BEQ     .+4             ;YES
010652  104000                           HLT                     ;GOOD = CORRECT ANS FOR CS2
010654  013701  001156                   MOV     UNCMP,GOOD      ;GET CORRECT DRIVE
010660  042701  177400                   BIC     #177400,GOOD    ;CLEAR UNWANTED BITS
010664  017700  170232                   MOV     @RSAS,BAD       ;GET RSAS REG
010670  020001                           CMP     BAD,GOOD        ;DID CORRECT UNIT ANSWER?
010672  001401                           BEQ     .+4             ;YES
010674  104100                           HLT     !AS             ;NO WRONG DRIVE ANSWERED
```

```
2132  010676  023777  001102  170206          CMP     @#OBUFSV,@RSBA  ;DID BA MOVE
2133  010704  001401                          BEQ     .+4             ;NO
2134  010706  104021                          HLT     !CS1!BA         ;BA MOVED ON AN ILLEGAL FUNCTION
2135  010710  022777  177777  170172          CMP     #-1,@RSWC       ;DID WC MOVE?
2136  010716  001401                          BEQ     .+4             ;NO
2137  010720  104011                          HLT     !CS1!WC         ;WC MOVED
2138  010722  005777  170166                  TST     @RSDA           ;DID DA MOVE
2139  010726  001401                          BEQ     .+4             ;NO
2140  010730  104005                          HLT     !CS1!DA         ;DA MOVED
2141  010732  104414                          CLRDK                   ;CLEAR ALL ERRORS
2142  010734  005777  170160                  TST     @RSER           ;DID ERRORS CLEAR
2143  010740  001401                          BEQ     .+4             ;YES
2144  010742  104040                          HLT     !DS             ;ILF DID NOT CLEAR
2145  010744  022777  004200  170132          CMP     #4200,@RSCS1    ;DID ERRORS IN CS1 CLEAR
2146  010752  001401                          BEQ     .+4             ;YES
2147  010754  104040                          HLT     !DS
2148  010756  000137  010530                  JMP     3$              ;CONTINUE UNTIL DONE
2149  010762                          ILFDN:                          ;DONE WITH ILLEGAL FUNCTION TEST
2150                                  ;*****************************************************************************
2151                                  ;TEST 61                ILLEGAL FUNCTION CODE TEST CODE 53 TO 77
2152                                  ;*****************************************************************************
2153  010762  104400                  TST61:  SCOPE
2154
2155                                  ;TEST ILF BIT IN RSER AND ERR BIT IN RSDS
2156                                  ;ALSO CHECKS TO SEE IF WC,BA, OR DA GOT MODIFIED
2157                                  ;IF WISHING TO LOOP ON ONE FUNCTION ONLY, LOAD
2158                                  ;FUNCTION INTO LOCATION ILFTB2: AND 0 IN FOLLOWING LOCATION
2159
2160  010764  104414                  ILLFUN: CLRDK                   ;CLEAR ALL RS REG
2161  010766  012703  027342          1$:     MOV     #ILFTB2,R3      ;GET TABLE OF ILL FUNS.
2162  010772  005037  001174          3$:     CLR     WORK            ;CLEAR WORK
2163  010776  012300                          MOV     (R3)+,BAD       ;GET ILL FUN
2164  011000  001554                          BEQ     ILFDNE          ;DONE GET OUT
2165  011002  013777  001102  170102          MOV     @#OBUFSV,@RSBA  ;SET UP REGS.
2166  011010  012777  177777  170072          MOV     #-1,@RSWC       ;TO CHECK FOR CHANGE
2167  011016  010037  001176                  MOV     BAD,WORK1       ;SHOULD WE TEST
2168  011022  042737  177707  001176          BIC     #177707,WORK1   ;BA AND WC
2169  011030  022737  000060  001176          CMP     #60,WORK1       ;TO INC
2170  011036  001003                          BNE     2$              ;NO
2171  011040  012737  000007  001174          MOV     #7,WORK         ;YES
2172  011046  010077  170032          2$:     MOV     BAD,@RSCS1      ;DO ILLEGAL FUNCTION
2173  011052  042700  000001          10$:    BIC     #BIT0,BAD       ;CLEAR GO BIT
2174  011056  010001                          MOV     BAD,GOOD        ;MOV ILLEGAL FUN INTO GOOD
```

```
2175  011060  105777  170020          6$:   TSTB    @RSCS1          ;RDY SET?
2176  011064  100375                        BPL     6$              ;NO
2177  011066  052701  144200                BIS     #144200,GOOD    ;SET ERROR BITS
2178  011072  017700  170006                MOV     @RSCS1,BAD      ;PUT CS1 INTO BAD
2179  011076  020100                        CMP     GOOD,BAD        ;IS CS1 CORRECT?
2180  011100  001401                        BEQ     .+4             ;YES
2181  011102  104000                        HLT                     ;GOOD IS WHAT CS1 SHOULD =BAD=CS1
2182  011104  022777  000001  170006        CMP     #1,@RSER        ;DID ILF SET?
2183  011112  001401                        BEQ     .+4             ;YES
2184  011114  104043                        HLT     !CS1!ER!DS      ;ILF DID NOT SET
2185  011116  022777  150600  167772        CMP     #150600,@RSDS   ;IS DS GOOD?
2186  011124  001401                        BEQ     .+4             ;YES
2187  011126  104043                        HLT     !CS1!ER!DS      ;ERR DID NOT SET
2188  011130  005777  167760                TST     @RSDA           ;DID DA MOVE?
2189  011134  001401                        BEQ     .+4             ;NO
2190  011136  104005                        HLT     !CS1!DA         ;DA MOVED
2191  011140  005737  001174                TST     WORK            ;IS THIS AN ILL WRITE FUN?
2192  011144  001025                        BNE     11$             ;YES
2193  011146  017700  167734                MOV     @RSCS2,BAD      ;GET CS2
2194  011152  013701  001152                MOV     UNNUM,GOOD      ;GET UNIT #
2195  011156  052701  001100                BIS     #1100,GOOD      ;SET IR BIT
2196  011162  020100                        CMP     GOOD,BAD        ;IS CS2 CORRECT?
2197  011164  001401                        BEQ     .+4             ;YES
2198  011166  104000                        HLT                     ;GOOD = CORRECT ANS FOR CS2
2199  011170  023777  001102  167714        CMP     @#OBUFSV,@RSBA  ;DID BA MOVE
2200  011176  001401                        BEQ     .+4             ;NO
2201  011200  104021                        HLT     !CS1!BA         ;BA MOVED ON AN ILLEGAL FUNCTION
2202  011202  022777  177777  167700        CMP     #-1,@RSWC       ;DID WC MOVE?
2203  011210  001401                        BEQ     .+4             ;NO
2204  011212  104011                        HLT     !CS1!WC         ;WC MOVED
2205  011214  000137  011302                JMP     4$              ;CONTINUE UNTIL DONE
2206  011220  017700  167662          11$:  MOV     @RSCS2,BAD      ;GET CS2
2207  011224  013701  001152                MOV     UNNUM,GOOD      ;GET UNIT #
2208  011230  052701  001300                BIS     #1300,GOOD      ;SET IR BIT
2209  011234  020100                        CMP     GOOD,B          ;IS CS2 CORRECT?
2210  011236  001401                        BEQ     .+4             ;YES
2211  011240  104000                        HLT                     ;GOOD = CORRECT ANS FOR CS2
2212  011242  013737  001102  001174        MOV     @#OBUFSV,WORK   ;GET BUFFER ADDR.
2213  011250  062737  000002  001174        ADD     #2,WORK         ;UPDATE IT
2214  011256  023777  001174  167626        CMP     WORK,@RSBA      ;DID BA MOVE
2215  011264  001401                        BEQ     .+4             ;YES
2216  011266  104021                        HLT     !CS1!BA         ;BA MOVED ON AN ILLEGAL FUNCTION
2217  011270  022777  000000  167612        CMP     #0,@RSWC        ;DID WC MOVE?
2218  011276  001401                        BEQ     .+4             ;NO
2219  011300  104011                        HLT     !CS1!WC         ;WC MOVED
2220  011302  104414                  4$:   CLRDK                   ;CLEAR ALL ERRORS
2221  011304  022777  004200  167572        CMP     #4200,@RSCS1    ;DID ERRORS CLEAR
2222  011312  001401                        BEQ     .+4             ;YES
2223  011314  104040                        HLT     !DS             ;NO
2224  011316  005777  167576                TST     @RSER           ;DID ERROR CLEAR
2225  011322  001401                        BEQ     .+4             ;NO
2226  011324  104040                        HLT     !DS             ;YES
2227  011326  000137  010772                JMP     3$              ;CONTINUE UNTIL DONE
2228  011332                          ILFDNE:                       ;DONE WITH ILLEGAL FUNCTION TEST
```

```
2229                                    ;*****************************************************************************
2230                                    ;TEST 62                    TEST ILLEGAL FUNCTION CODE 67
2231                                    ;*****************************************************************************
2232  011332  104400                    TST62:  SCOPE
2233
2234  011334  104414                    ILF67:  CLRDK                           ;CLEAR ALL RS REG
2235  011336  012777  177777  167544            MOV     #-1,@RSWC               ;SET WC TO -1
2236  011344  013737  001102  001174            MOV     @#OBUFSV,WORK           ;GET OUTBUF ADD.
2237  011352  062737  000002  001174            ADD     #2,WORK                 ;FOR TEST
2238  011360  013777  001174  167524            MOV     WORK,@RSBA              ;LOAD ADDR.
2239  011366  012777  000067  167510            MOV     #67,@RSCS1              ;DO FUNCTION 67
2240  011374  105777  167504            1$:     TSTB    @RSCS1                  ;DONE YET?
2241  011400  100375                            BPL     1$                      ;NO
2242  011402  017700  167504                    MOV     @RSBA,BAD               ;GET BA REG
2243  011406  013701  001102                    MOV     @#OBUFSV,GOOD           ;GET CORRECT ANS FOR RSBA
2244  011412  020100                            CMP     GOOD,BAD                ;IS RSBA CORRECT?
2245  011414  001401                            BEQ     .+4                     ;YES
2246  011416  104000                            HLT                             ;BAD=RSBA GOOD=CORRECT ANS.
2247  011420  013701  001152                    MOV     UNNUM,GOOD              ;GET UNIT NUMBER
2248  011424  052701  001300                    BIS     #1300,GOOD              ;SET IR AND OR BITS
2249  011430  017700  167452                    MOV     @RSCS2,BAD              ;GET CS2
2250  011434  020100                            CMP     GOOD,BAD                ;IS CS2 CORRECT?
2251  011436  001401                            BEQ     .+4                     ;YES
2252  011440  104000                            HLT                             ;BAD=CS2 GOOD=CORRECT ANS
2253  011442  022777  000001  167450            CMP     #1,@RSER                ;IS RSER CORRECT?
2254  011450  001401                            BEQ     .+4                     ;YES
2255  011452  104002                            HLT     !ER                     ;ER IS WRONG
2256  011454  104414                            CLRDK                           ;CLEAR ALL RS REG
2257  011456  005777  167436                    TST     @RSER                   ;DID ERROR CLEAR
2258  011462  001401                            BEQ     .+4                     ;YES
2259  011464  104040                            HLT     !DS                     ;NO
2260  011466  012777  177700  167414            MOV     #-100,@RSWC             ;SET WC TO -100
2261  011474  013737  001102  001174            MOV     @#OBUFSV,WORK           ;GET OUTBUF ADD.
2262  011502  062737  000200  001174            ADD     #200,WORK               ;FOR TEST
2263  011510  013777  001174  167374            MOV     WORK,@RSBA              ;LOAD ADDR
2264  011516  012777  000067  167360            MOV     #67,@RSCS1              ;DO FUNCTION 67
2265  011524  105777  167354            2$:     TSTB    @RSCS1                  ;DONE YET?
2266  011530  100375                            BPL     2$                      ;NO
```

```
2267  011532  013701  001102          3$:   MOV   @#OBUFSV,GOOD   ;GET CORRECT ANS.
2268  011536  017700  167350                MOV   @RSBA,BAD       ;GET BA REG
2269  011542  020100                       CMP   GOOD,BAD        ;IS RSBA CORRECT?
2270  011544  001401                       BEQ   .+4             ;YES
2271  011546  104000                       HLT                   ;BAD=RSBA GOOD=CORRECT ANS.
2272  011550  013701  001152                MOV   UNNUM,GOOD      ;GET UNIT NUMBER
2273  011554  052701  001300                BIS   #1300,GOOD      ;SET IR AND OR BITS
2274  011560  017700  167322                MOV   @RSCS2,BAD      ;GET CS2
2275  011564  020100                       CMP   GOOD,BAD        ;IS CS2 CORRECT?
2276  011566  001401                       BEQ   .+4             ;YES
2277  011570  104000                       HLT                   ;BAD=CS2 GOOD=CORRECT ANS
2278  011572  022777  000001  167320       CMP   #1,@RSER        ;IS RSER CORRECT?
2279  011600  001401                       BEQ   .+4             ;YES
2280  011602  104002                       HLT   !ER             ;ER IS WRONG
2281  011604  012777  040011  167272       MOV   #40011,@RSCS1   ;CLEAR ERRORS
2282  011612  022777  004210  167264       CMP   #4210,@RSCS1    ;DID THEY CLEAR IN CS1
2283  011620  001401                       BEQ   .+4             ;YES
2284  011622  104040                       HLT   !DS             ;NO
2285  011624  005777  167270                TST   @RSER           ;DID RSER CLEAR
2286  011630  001401                       BEQ   .+4             ;YES
2287  011632  104040                       HLT   !DS             ;NO
2288  011634  005777  167262                TST   @RSAS           ;DID RSAS CLEAR
2289  011640  001401                       BEQ   .+4             ;YES
2290  011642  104100                       HLT   !AS             ;NO
2291
2292                          ;*************************************************************************
2293                          ;TEST 63                    TEST PAR IN RSER
2294                          ;*************************************************************************
2295  011644  104400          TST63:  SCOPE
2296
2297  011646  013737  001164  022414  PARTST: MOV   TIMSV,TIMES   ;RESTORE LOOP #
2298  011654  104414                       CLRDK                 ;CLEAR ALL RS REG
2299  011656  012777  000010  167234  1$:   MOV   #10,@RSER       ;SET PAR
2300  011664  022777  150600  167224       CMP   #150600,@RSDS   ;DID ERR,ATA AND DRY SET?
2301  011672  001401                       BEQ   .+4             ;YES
2302  011674  104042                       HLT   !DS!ER          ;ER SHOULD SET IF PAR SETS IN RSER
2303  011676  104414                       CLRDK                 ;CLEAR ALL RS REG
2304  011700  005777  167214                TST   @RSER           ;DID PAR CLEAR?
2305  011704  001401                       BEQ   .+4             ;YES
2306  011706  104002                       HLT   !ER             ;PAR DID NOT CLEAR BY CLEAR  BIT
2307  011710  022777  010600  167200       CMP   #10600,@RSDS    ;DID ERROR BITS CLEAR
2308  011716  001401                       BEQ   .+4             ;YES
2309  011720  104040                       HLT   !DS             ;NO
```

```
                                        ;CHECK BITS 12 TO 15 FOR 0
                                        ;CHECK SECTOR FRACTION TO WATCH FOR MOVEMENT
                                        ;CHECK CS BITS IN LA AND ADDRESS CONFIRM IN MR REG
                                        ;
                                        ;*************************************************************************
                                        ;TEST 64                    LOOK AHEAD TEST
                                        ;*************************************************************************
011722  104400                  TST64:  SCOPE
                                        ;
011724  032777  170000  167172  LATST:  BIT     #170000,@RSLA   ;ARE BITS 12 TO 15 CLEARED?
011732  001401                          BEQ     .+4             ;YES
011734  104204                          HLT     !LA             ;BITS 12 TO 15 SHOULD BE CLEARED
011736  104400                  TST65:  SCOPE
                                        ;
                                        ;NOW TEST MOVEMENT IN SF BITS
                                        ;
011740  012737  171005  001174          MOV     #171005,WORK    ;SET UP FOR TIME OUT ROUTIME
011746  017701  167152                  MOV     @RSLA,GOOD      ;GET READING FROM LA
011752  042701  007700                  BIC     #7700,GOOD      ;GET RID OF CS BITS
011756  005337  001174          1$:     DEC     WORK            ;WAIT FOR DISK
011762  001407                          BEQ     ERRR            ;TYPE ERROR
011764  017700  167134                  MOV     @RSLA,BAD       ;READ LA
011770  042700  007700                  BIC     #7700,BAD       ;CLEAR CS BITS
011774  020100                          CMP     GOOD,BAD        ;DID SF BITS CHANGE?
011776  001767                          BEQ     1$              ;WAIT FOR TIME OUT
012000  000422                          BR      LATDON          ;LA OK CONT
012002                          ERRR:
012002  104402  012006                  TYPE    .+2             ;.ASCIZ <15><12>"SECTOR FRACTIONS NOT MOVING"
012044  104204                          HLT     !LA             ;TYPE LOOK AHEAD REG
012046                          LATDON:                         ;DONE CONT.
```

```
2340                                    ;*************************************************************************
2341                                    ;TEST 66                CHECK CS BITS TO INCREMENT AND  ADDRESS CONFIRM BIT IN MR
2342                                    ;*************************************************************************
2343  012046  104400                   TST66:  SCOPE
2344
2345  012050  013737  022414  001164   CSTST:  MOV     TIMES,TIMSV     ;SAVE LOOP CT
2346  012056  012737  000010  022414           MOV     #10,TIMES       ;LOOP 10 TIMES
2347  012064  104414                           CLRDK                   ;CLEAR ALL RS REG.
2348  012066  012701  001000                   MOV     #1000,GOOD      ;LOAD COUNTER
2349  012072  032777  001000  167030           BIT     #BIT9,@RSMR     ;IS ADD CONFIRM BIT 0?
2350  012100  001407                           BEQ     ADDCF           ;YES CONTINUE
2351  012102  005301                           DEC     GOOD            ;WAIT FOR
2352  012104  001376                           BNE     .-2             ;DISK TO MOVE
2353  012106  032777  001000  167014           BIT     #BIT9,@RSMR     ;IS AADD. CON. BIT BIT 0?
2354  012114  001401                           BEQ     .+4             ;YES
2355  012116  104220                           HLT     !MR             ;ADD. CONF. BIT ALWAYS A 1
2356
2357                                    ;NOW TEST TA BITS AND ADD. CON. BIT IN MR
2358
2359  012120  012777  177777  166766   ADDCF:  MOV     #-1,@RSDA       ;INIT RSDA
2360  012126  012737  177777  001174   1$:     MOV     #-1,WORK        ;SETUP TIMEOUT COUNTER
2361  012134  005277  166754                   INC     @RSDA           ;GET NEXT SECTOR
2362  012140  022777  010000  166746           CMP     #10000,@RSDA    ;DONE ALL YET?
2363  012146  001433                           BEQ     DONCS           ;YES
2364  012150  005337  001174           2$:     DEC     WORK            ;DO TIMEOUT ROUTINE
2365  012154  001427                           BEQ     TMEOUT          ;ADD. CON. NEVER CAME UP
2366  012156  032777  001000  166744           BIT     #1000,@RSMR     ;DID ADD CONFIRM BIT SET?
2367  012164  001771                           BEQ     2$              ;YES
2368  012166  017700  166732                   MOV     @RSLA,BAD       ;GET LA
2369  012172  042700  000077                   BIC     #77,BAD         ;CLEAR SF BITS
2370  012176  012737  000006  001176           MOV     #6,WORK1        ;SET UP COUNTER
2371  012204  006000                   3$:     ROR     BAD             ;MOV SA BITS RIGHT
2372  012206  005337  001176                   DEC     WORK1           ;DO 6 TIMES
2373  012212  001374                           BNE     3$              ;DONE YET?
2374  012214  017701  166674                   MOV     @RSDA,GOOD      ;GET DA
2375  012220  042701  177700                   BIC     #177700,GOOD    ;CLEAR JUNK
2376  012224  020100                           CMP     GOOD,BAD        ;ARE SA BITS = IN DA AND LA REG.?
2377  012226  001401                           BEQ     .+4             ;OK
2378  012230  104000                           HLT                     ;GOOD =DA BAD = LA
2379  012232  000735                           BR      1$              ;NO WAIT
2380
2381  012234  104262                   TMEOUT: HLT     !MR!ER!DS       ;ADDRESS CONFIRM BIT NEVER SET COULD BE BAD OR
2382                                                                   ;BAD LA OR BAD COMPARE BETWEEN LA AND DA
2383  012236                           DONCS:                          ;TEST DONE CONTINUE
```

```
2384                                    ;*************************************************************************
2385                                    ;TEST 67                PARITY TEST
2386                                    ;*************************************************************************
2387  012236  104400                    TST67:  SCOPE
2388
2389  012240  013737  001164  022414    PART:   MOV     TIMSV,TIMES     ;RESTORE LOOP COUNTER
2390  012246  012737  012426  000004            MOV     #PRTP,@#4       ;SETUP TIME OUT VECTOR
2391  012254  012737  000340  000006            MOV     #340,@#6
2392  012262  012702  172100                    MOV     #MPR0,R2        ;GET PAR REG
2393  012266  005712                    TSTAGN: TST     (R2)            ;DOES IT EXIST
2394  012270  012712  000004                    MOV     #WWP,@R2        ;YES SET WRITE WRONG PARITY
2395  012274  012701  001174                    MOV     #WORK,R1        ;GET TEST LOCATION
2396  012300  011111                    1$:     MOV     @R1,@R1         ;WRITE WRONG PARITY
2397  012302  005711                            TST     @R1             ;READ IT
2398  012304  005712                            TST     @R2             ;DID PARITY ERROR SET?
2399  012306  100402                            BMI     2$              ;YES
2400  012310  005012                            CLR     @R2             ;CLEAR PARITY REG
2401  012312  000446                            BR      PRTP1           ;GET NEXT PARITY REG
2402  012314  012712  000001            2$:     MOV     #1,@R2          ;CLEAR WWP AND ENABLE BAD PARITY
2403  012320  104414                            CLRDK                   ;CLEAR ALL RS REG
2404  012322  012737  177777  027364            MOV     #177777,OUTBUF  ;DATA TO BE X-FERED
2405  012330  012777  001174  166554            MOV     #WORK,@RSBA     ;SET UP CURRENT ADDRESS
2406  012336  012777  177777  166544            MOV     #-1,@RSWC       ;SET WORD COUNT TO -1
2407  012344  012777  000061  166532            MOV     #61,@RSCS1      ;GO WRITE
2408  012352  105777  166526            3$:     TSTB    @RSCS1          ;DONE YET?
2409  012356  100375                            BPL     3$              ;NO WAIT
2410  012360  005012                            CLR     @R2             ;CLEAR PARITY REG
2411  012362  005037  001174                    CLR     WORK            ;WRITE GOOD PARITY
2412  012366  017700  166514                    MOV     @RSCS2,BAD      ;GET CS2
2413  012372  012701  020100                    MOV     #20100,GOOD
2414  012376  053701  001152                    BIS     UNNUM,GOOD      ;GET CORRECT AND FOR CS2
2415  012402  020100                            CMP     GOOD,BAD        ;IS CS2 CORRECT?
2416  012404  001401                            BEQ     .+4             ;YES
2417  012406  104000                            HLT                     ;CS2 SHOULD = GOOD
2418  012410  022777  144260  166466            CMP     #144260,@RSCS1  ;IS CS1 CORRECT?
2419  012416  001401                            BEQ     .+4             ;YES
2420  012420  104040                            HLT     !DS
2421  012422  000137  012446                    JMP     NOPAR           ;GET OUT
2422
2423                                    ;TRAPOUT ROUTINE
2424
2425  012426  022626                    PRTP:   CMP     (6)+,(6)+       ;CLEAR STACK
2426  012430  022702  172136            PRTP1:  CMP     #172136,R2      ;DONE YET?
2427  012434  001404                            BEQ     NOPAR           ;YES NO PAR REG
2428  012436  062702  000002                    ADD     #2,R2           ;NO TRY AGAIN
2429  012442  000137  012266                    JMP     TSTAGN          ;RETRY
2430
2431  012446  012737  000006  000004    NOPAR:  MOV.    #6,@#4
2432  012454  005037  000006                    CLR     @#6
```

```
                                ;*****************************************************************************
                                ;TEST 70                        TEST WRITE CHECK ERROR
                                ;*****************************************************************************
012460  104400                  TST70:  SCOPE

                                ;WRITE A WORD OF 0 AND FLOAT A 1 TRSOUGH IT TO CAUSE WCE
                                ;SET BIT14 IN ONCEE AND WRITE A WD OF -1 AND FLOAT 0
                                ;TO CAUSE WCE

012462  104414                  WCETST: CLRDK                           ;CLEAR ALL RS REG
012464  005037  027364                  CLR     OUTBUF                  ;WRITE A WD OF 0
012470  013777  001102  166414  WCETT:  MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
012476  012777  177777  166404          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
012504  012777  000061  166372          MOV     #61,@RSCS1              ;GO WRITE
012512  105777  166366          3$:     TSTB    @RSCS1                  ;DONE YET?
012516  100375                          BPL     3$                      ;NO WAIT
012520  032737  040000  001160          BIT     #BIT14,ONCEE            ;WRITE A 1 OR 0?
012526  001410                          BEQ     2$                      ;WRITE A 0
012530  012737  177777  027364          MOV     #-1,OUTBUF              ;WRITE A 1
012536  000241                          CLC                             ;CLEAR CARRY
012540  006137  027364          6$:     ROL     OUTBUF                  ;FLOAT A 0 THROUGH BAD WD
012544  103123                          BCC     WCEDON                  ;DONE GET OUT
012546  000406                          BR      5$                      ;CHECK WCE
012550  005037  027364          2$:     CLR     OUTBUF                  ;WRITE A 0
012554  000261                          SEC                             ;SET CARRY
012556  006137  027364          1$:     ROL     OUTBUF                  ;FLOAT A 1
012562  103503                          BCS     WCEDNE                  ;GET OUT WHEN DONE
012564  013777  001102  166320  5$:     MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
012572  012777  177777  166310          MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
012600  005077  166310                  CLR     @RSDA
012604  012777  000051  166272          MOV     #51,@RSCS1              ;GO WRITE CHECK
012612  105777  166266          4$:     TSTB    @RSCS1                  ;READY YET?
012616  100375                          BPL     4$                      ;NO WAIT
012620  017700  166262                  MOV     @RSCS2,BAD              ;GET CS2
012624  013701  001152                  MOV     UNNUM,GOOD              ;SET UNIT #
012630  052701  040300                  BIS     #40300,GOOD             ;SET BITS
012634  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
012636  001413                          BEQ     7$                      ;YES
012640  104000                          HLT                             ;BAD=CS2 GOOD=CORRECT ANS
012642  013700  027364                  MOV     OUTBUF,BAD              ;GET BAD WD THAT SHOULD CAUSE WCE
012646  005001                          CLR     GOOD                    ;GET GOOD WD IF WRITING 0
012650  032737  040000  001160          BIT     #BIT14,ONCEE            ;ARE WE WRITING 1 OR 0
012656  001402                          BEQ     8$                      ;0
012660  012701  177777                  MOV     #-1,GOOD                ;GET GOOD WD FOR 1
012664  104000          8$:     HLT                                     ;GOOD = CORRECT WD WRITTEN
                                                                        ;BAD = INCORRECT WD THAT WCE DID NOT CATCH
```

```
2479  012666  022777  144250  166210  7$:     CMP     #144250,@RSCS1  ;DID TRE SET?
2480  012674  001401                          BEQ     .+4             ;YES
2481  012676  104043                          HLT     !CS1!ER!DS      ;TRE SHOULD SET IF WCE SETS
2482  012700  017700  166206                  MOV     @RSBA,BAD       ;FETCH CURRENT ADDRESS
2483  012704  013701  001102                  MOV     @#OBUFSV,GOOD   ;WHAT RSBA SHOULD EQUAL
2484  012710  062701  000002                  ADD     #2,GOOD         ;UPDATE IT
2485  012714  020001                          CMP     BAD,GOOD        ;IS RSBA CORRECT
2486  012716  001401                          BEQ     .+4             ;YES EXECUTE CONTINUE
2487  012720  104000                          HLT                     ;RSBA FAILED TO INCREMENT
2488  012722  104414                          CLRDK                   ;CLEAR ALL RS REG
2489  012724  013701  001152                  MOV     UNNUM,GOOD      ;PUT DRIVE IN GOOD
2490  012730  052701  000100                  BIS     #100,GOOD       ;SET IR BIT
2491  012734  017700  166146                  MOV     @RSCS2,BAD      ;GET CS2
2492  012740  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT
2493  012742  001401                          BEQ     .+4             ;YES
2494  012744  104000                          HLT                     ;BAD =CS2 GOOD IS CORRECT ANS
2495  012746  022777  004200  166130          CMP     #4200,@RSCS1    ;DID TRE CLEAR?
2496  012754  001401                          BEQ     .+4             ;YES
2497  012756  104001                          HLT     !CS1            ;TRE DID NOT CLEAR WITH CLEAR
2498  012760  032737  040000  001160          BIT     #BIT14,ONCEE    ;FLOATION A 1 OR 0?
2499  012766  001673                          BEQ     1$              ;FLOAT 1
2500  012770  000663                          BR      6$              ;FLOAT 0
2501  012772  052737  040000  001160  WCEDNE: BIS     #BIT14,ONCEE    ;SET BIT14
2502  013000  104414                          CLRDK
2503  013002  012737  177777  027364          MOV     #-1,OUTBUFF
2504  013010  000137  012470                  JMP     WCETT           ;NOW WRITE -1 IN OUTBUF
2505  013014  042737  040000  001160  WCEDON: BIC     #BIT14,ONCEE    ;CLEAR TEST FLAG
```

```
2506                                    ;*****************************************************************************
2507                                    ;TEST 71                TEST WRITE CHECK ERROR ON -B- PORT
2508                                    ;*****************************************************************************
2509  013022  104400                    TST71:  SCOPE
2510
2511                                    ;WRITE A WORD OF 0 AND FLOAT A 1 TRSOUGH IT TO CAUSE WCE
2512                                    ;SET BIT14 IN ONCEE AND WRITE A WD OF -1 AND FLOAT 0
2513                                    ;TO CAUSE WCE
2514
2515  013024  032737  020000  001160    WCETSB: BIT     #BIT13,ONCEE    ;-B- PORT?
2516  013032  001402                            BEQ     1$              ;YES
2517  013034  000137  013400                    JMP     WCEDOS          ;NO GET OUT
2518  013040  013737  001170  001102    1$:     MOV     BPORTT,OBUFSV   ;GET -B- PORT BUFFER
2519  013046  104414                            CLRDK                   ;CLEAR ALL RS REG
2520  013050  005077  166114                    CLR     @BPORTT         ;WRITE A WD OF 0
2521  013054  013777  001102  166030    WCETB:  MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
2522  013062  012777  177777  166020            MOV     #-1,@RSWC       ;SET WORD COUNT TO -1
2523  013070  012777  002061  166006            MOV     #2061,@RSCS1    ;GO WRITE
2524  013076  105777  166002            3$:     TSTB    @RSCS1          ;DONE YET?
2525  013102  100375                            BPL     3$              ;NO WAIT
2526  013104  032737  040000  001160            BIT     #BIT14,ONCEE    ;WRITE A 1 OR 0?
2527  013112  001410                            BEQ     2$              ;WRITE A 0
2528  013114  012777  177777  166046            MOV     #-1,@BPORTT     ;WRITE A 1
2529  013122  000241                            CLC                     ;CLEAR CARRY
2530  013124  006137  027364            6$:     ROL     OUTBUF          ;FLOAT A 0 THROUGH BAD WD
2531  013130  103123                            BCC     WCEDOS          ;DONE GET OUT
2532  013132  000406                            BR      5$              ;CHECK WCE
2533  013134  005077  166030            2$:     CLR     @BPORTT         ;WRITE A 0
2534  013140  000261                            SEC                     ;SET CARRY
2535  013142  006177  166022            1$:     ROL     @BPORTT         ;FLOAT A 1
2536  013146  103503                            BCS     WCEDNB          ;GET OUT WHEN DONE
2537  013150  013777  001102  165734    5$:     MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
2538  013156  012777  177777  165724            MOV     #-1,@RSWC       ;SET WORD COUNT TO -1
2539  013164  005077  165724                    CLR     @RSDA
2540  013170  012777  002051  165706            MOV     #2051,@RSCS1    ;GO WRITE CHECK
2541  013176  105777  165702            4$:     TSTB    @RSCS1          ;READY YET?
2542  013202  100375                            BPL     4$              ;NO WAIT
2543  013204  017700  165676                    MOV     @RSCS2,BAD      ;GET CS2
2544  013210  013701  001152                    MOV     UNNUM,GOOD      ;SET UNIT #
2545  013214  052701  040300                    BIS     #40300,GOOD     ;SET BITS
2546  013220  020100                            CMP     GOOD,BAD        ;IS CS2 CORRECT?
2547  013222  001413                            BEQ     7$              ;YES
2548  013224  104000                            HLT                     ;CS2=BAD GOOD=CORRECT ANS
2549  013226  017700  165736                    MOV     @BPORTT,BAD     ;GET BAD WD THAT SHOULD CAUSE WCE
2550  013232  005001                            CLR     GOOD            ;GET GOOD WD IF WRITING 0
2551  013234  032737  040000  001160            BIT     #BIT14,ONCEE    ;ARE WE WRITING 1 OR 0
2552  013242  001402                            BEQ     8$              ;0
2553  013244  012701  177777                    MOV     #-1,GOOD        ;GET GOOD WD FOR 1
2554  013250  104000                    8$:     HLT                     ;GOOD = CORRECT WD WRITTEN
2555                                            ;BAD = INCORRECT WD THAT WCE DID NOT CATCH
```

```
2556  013252  022777  146250  165624  7$:     CMP     #146250,@RSCS1  ;DID TRE SET?
2557  013260  001401                          BEQ     .+4             ;YES
2558  013262  104043                          HLT     !CS1!ER!DS      ;TRE SHOULD SET IF WCE SETS
2559  013264  017700  165622                  MOV     @RSBA,BAD       ;FETCH CURRENT ADDRESS
2560  013270  013701  001102                  MOV     @#OBUFSV,GOOD   ;WHAT RSBA SHOULD EQUAL
2561  013274  062701  000002                  ADD     #2,GOOD         ;UPDATE IT
2562  013300  020001                          CMP     BAD,GOOD        ;IS RSBA CORRECT
2563  013302  001401                          BEQ     .+4             ;YES EXECUTE CONTINUE
2564  013304  104000                          HLT                     ;RSBA FAILED TO INCREMENT
2565  013306  104414                          CLRDK                   ;CLEAR ALL RS REG
2566  013310  013701  001152                  MOV     UNNUM,GOOD      ;PUT DRIVE IN GOOD
2567  013314  052701  000100                  BIS     #100,GOOD       ;SET IR BIT
2568  013320  017700  165562                  MOV     @RSCS2,BAD      ;GET CS2
2569  013324  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT
2570  013326  001401                          BEQ     .+4             ;YES
2571  013330  104000                          HLT                     ;BAD =CS2 GOOD IS CORRECT ANS
2572  013332  022777  004200  165544          CMP     #4200,@RSCS1    ;DID TRE CLEAR?
2573  013340  001401                          BEQ     .+4             ;YES
2574  013342  104001                          HLT     !CS1            ;TRE DID NOT CLEAR WITH CLEAR
2575  013344  032737  040000  001160          BIT     #BIT14,ONCEE    ;FLOATION A 1 OR 0?
2576  013352  001673                          BEQ     1$              ;FLOAT 1
2577  013354  000663                          BR      6$              ;FLOAT 0
2578  013356  052737  040000  001160  WCEDNB: BIS     #BIT14,ONCEE    ;SET BIT14
2579  013364  104414                          CLRDK
2580  013366  012777  177777  165574          MOV     #-1,@BPORTT
2581  013374  000137  013054                  JMP     WCETB           ;NOW WRITE -1 IN OUTBUF
2582  013400  012737  027364  001102  WCEDOS: MOV     #OUTBUF,OBUFSV  ;RESTORE OBUFSV
2583  013406  042737  040000  001160          BIC     #BIT14,ONCEE    ;CLEAR TEST FLAG
```

```
                                ;*****************************************************************************
                                ;TEST 72                    TEST PROGRAM ERROR BIT IN RSCS2
                                ;*****************************************************************************
013414  104400                  TST72:  SCOPE

013416  104414                  PGETST: CLRDK                           ;CLEAR ALL RS REG
013420  012737  177777  027364          MOV     #177777,OUTBUF          ;DATA TO BE X-FERED
013426  013777  001102  165456          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
013434  012777  177000  165446          MOV     #177000,@RSWC           ;SET WORD COUNT
013442  012777  000061  165434          MOV     #61,@RSCS1              ;GO WRITE
013450  105777  165430          2$:     TSTB    @RSCS1                  ;IS RDY CLEARED YET?
013454  100775                        BMI     2$                      ;NO WAIT
013456  012777  000071  165420          MOV     #71,@RSCS1              ;GO READ
013464  004737  026600                  JSR     PC,WAITRY               ;WAIT FOR READY
013470  104001                        HLT     !CS1                    ;RDY NEVER CAME UP
013472  022777  144260  165404          CMP     #144260,@RSCS1          ;IS CS1 CORRECT?
013500  001401                        BEQ     .+4                     ;YES
013502  104001                        HLT     !CS1                    ;TRE SHOULD SET BY SETTING PGE
013504  005777  165412                TST     @RSAS                   ;AS SHOULD = 0
013510  001401                        BEQ     .+4                     ;YES
013512  104100                        HLT     !AS                     ;RSAS SHOULD = 0
013514  013701  001152                MOV     UNNUM,GOOD              ;GET UNIT #
013520  052701  002300                BIS     #2300,GOOD              ;SET PGE, IR, AND OR
013524  017700  165356                MOV     @RSCS2,BAD              ;GET CS2
013530  020100                        CMP     GOOD,BAD                ;IS IT CORRECT?
013532  001401                        BEQ     .+4                     ;YES
013534  104000                        HLT                             ;BAD = CS2
013536  005777  165346                TST     @RSWC                   ;SHOULD NOT BE 0
013542  001001                        BNE     .+4                     ;BECAUSE PGE SHOULD ABORT
013544  104011                        HLT     !WC!CS1                 ;CURRENT OPERATION
013546  005777  165346                TST     @RSER                   ;DID ANY ERRORS SET?
013552  001401                        BEQ     .+4                     ;NO
013554  104040                        HLT     !DS                     ;RMR SHOULD BE SET
013556  052777  040000  165320          BIS     #TRE,@RSCS1             ;CLEAR ERRORS
013564  042701  002000                BIC     #PGE,GOOD               ;CLEAR PGE ERROR
013570  017700  165312                MOV     @RSCS2,BAD              ;GET CS2
013574  020100                        CMP     GOOD,BAD                ;IS CS2 CORRECT?
013576  001401                        BEQ     .+4                     ;YES
013600  104200                        HLT     !CS2                    ;PGE DID NOT CLEAR BY CLEARING TRE BAD = CS2
013602  022777  004260  165274          CMP     #4260,@RSCS1            ;DID SC CLEAR
013610  001401                        BEQ     .+4                     ;YES
013612  104040                        HLT     !DS                     ;DID NOT CLEAR BY CLEARING TRE
```

```
                                ;*****************************************************************************
                                ;TEST 73                TEST RMR IN RSER REGISTER TRYING TO WRITE INTO RSDA
                                ;*****************************************************************************
013614  104400                TST73:  SCOPE

013616  104414                RMRT1:  CLRDK                           ;CLEAR ALL RS REG
013620  013777  001102  165264        MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
013626  012777  177700  165254        MOV     #177700,@RSWC           ;SET WORD COUNT
013634  012703  172060                MOV     #172060,R3              ;GET RSLA REG
013640  011304                1$:     MOV     @R3,R4                  ;WAIT FOR
013642  042704  000017                BIC     #17,R4                  ;THE MIDDLE
013646  022704  000020                CMP     #20,R4                  ;OF SECTOR 0
013652  001372                        BNE     1$                      ;BEFORE DOING A SEARCH
013654  012777  000031  165222        MOV     #31,@RSCS1              ;SEARCH
013662  012777  007777  165224        MOV     #7777,@RSDA             ;CAUSE ERROR
013670  004737  026600                JSR     PC,WAITRY               ;WAIT FOR READY
013674  104001                        HLT     !CS1                    ;RDY NEVER CAME UP
013676  022777  000004  165214        CMP     #4,@RSER                ;DID RMR SET?
013704  001401                        BEQ     .+4                     ;YES
013706  104002                        HLT     !ER                     ;ER SHOULD = 4
013710  022777  007777  165176        CMP     #7777,@RSDA             ;DID DA GET MODIFIED?
013716  001001                        BNE     .+4                     ;NO
013720  104004                        HLT     !DA
013722  022777  150600  165166        CMP     #150600,@RSDS           ;DID ERR SET?
013730  001401                        BEQ     .+4                     ;YES
013732  104042                        HLT     !DS!ER                  ;ER DID NOT SET BECAUSE OF RMR
013734  022777  104230  165142        CMP     #104230,@RSCS1          ;IS CS1 CORRECT?
013742  001401                        BEQ     .+4                     ;YES
013744  104040                        HLT     !DS                     ;CS1 SHOULD = 144260
013746  104414                        CLRDK                           ;CLEAR ALL RS REG
013750  005777  165144                TST     @RSER                   ;DID RMR CLEAR?
013754  001401                        BEQ     .+4                     ;YES
013756  104002                        HLT     !ER                     ;RMR DID NOT CLEAR WITH A CLEAR
013760  022777  004200  165116        CMP     #4200,@RSCS1            ;IS CS1 CORRECT?
013766  001401                        BEQ     .+4                     ;YES
013770  104040                        HLT     !DS                     ;NO

                                ;*****************************************************************************
                                ;TEST 74                TEST RMR IN RSER REGISTER TRYING TO WRITE INTO RSER
                                ;*****************************************************************************
013772  104400                TST74:  SCOPE

013774  104414                RMRT2:  CLRDK                           ;CLEAR ALL RS REG
013776  013777  001102  165106        MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
014004  012777  177700  165076        MOV     #177700,@RSWC           ;SET WORD COUNT
014012  012777  000061  165064        MOV     #61,@RSCS1              ;GO WRITE
014020  105777  165060        2$:     TSTB    @RSCS1                  ;IS RDY SET?
014024  100775                        BMI     2$                      ;YES WAIT FOR IT TO CLEAR
014026  012777  177773  165064        MOV     #177773,@RSER           ;CAUSE ERROR
```

```
2675  014034  004737  026600              JSR     PC,WAITRY
2676  014040  104001                      HLT     !CS1            ;RDY NEVER CAME UP
2677  014042  022777  000004  165050      CMP     #4,@RSER        ;DID RMR SET?
2678  014050  001401                      BEQ     .+4             ;YES
2679  014052  104002                      HLT     !ER             ;ER SHOULD = 4
2680  014054  022777  150600  165034      CMP     #150600,@RSDS   ;DID ERR SET?
2681  014062  001401                      BEQ     .+4             ;YES
2682  014064  104042                      HLT     !DS!ER          ;ERR DID NOT SET BECAUSE OF RMR
2683  014066  022777  144260  165010      CMP     #144260,@RSCS1  ;IS CS1 CORRECT?
2684  014074  001401                      BEQ     .+4             ;YES
2685  014076  104040                      HLT     !DS             ;CS1 SHOULD = 144260
2686  014100  104414                      CLRDK                   ;CLEAR ALL RS REG
2687
2688                          ;*************************************************************************
2689                          ;TEST 75                TEST RMR IN RSER REGISTER TRYING TO WRITE INTO RSCS1
2690                          ;*************************************************************************
2691  014102  104400          TST75:  SCOPE
2692
2693  014104  104414          RMRT3:  CLRDK                   ;CLEAR ALL RS REG
2694  014106  013777  001102  164776      MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
2695  014114  012777  177700  164766      MOV     #177700,@RSWC   ;SET WORD COUNT
2696  014122  012777  000061  164754      MOV     #61,@RSCS1      ;GO WRITE
2697  014130  105777  164750  2$:     TSTB    @RSCS1          ;IS RDY SET?
2698  014134  100775                      BMI     2$              ;YES WAIT FOR IT TO CLEAR
2699  014136  012777  000030  164740      MOV     #30,@RSCS1      ;CAUSE ERROR
2700  014144  004737  026600              JSR     PC,WAITRY       ;WAIT FOR READY
2701  014150  104001                      HLT     !CS1            ;RDY NEVER CAME UP
2702  014152  022777  000004  164740      CMP     #4,@RSER        ;DID RMR SET?
2703  014160  001401                      BEQ     .+4             ;YES
2704  014162  104002                      HLT     !ER             ;ER SHOULD = 4
2705  014164  022777  150600  164724      CMP     #150600,@RSDS   ;DID ERR SET?
2706  014172  001401                      BEQ     .+4             ;YES
2707  014174  104042                      HLT     !DS!ER          ;ERID NOT SET BECAUSE OF RMR
2708  014176  022777  144260  164700      CMP     #144260,@RSCS1  ;IS CS1 CORRECT?
2709  014204  001401                      BEQ     .+4             ;YES
2710  014206  104040                      HLT     !DS             ;CS1 SHOULD = 144260
2711  014210  104414                      CLRDK                   ;CLEAR ALL RS REG
```

```
                                ;*****************************************************************************
                                ;TEST 76                    TEST THAT RMR DOES NOT SET BY WRITTING INTO RSAS
                                ;*****************************************************************************
014212  104400          TST76:  SCOPE
                        RMRT4:  CLRDK                   ;CLEAR ALL RS REG
014214  104414
014216  013777  001102  164666          MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
014224  012777  177700  164656          MOV     #177700,@RSWC   ;SET WORD COUNT
014232  012703  172060                  MOV     #172060,R3      ;GET RSLA REG
014236  011304          1$:             MOV     @R3,R4          ;WAIT FOR
014240  042704  000017                  BIC     #17,R4          ;THE MIDDLE
014244  022704  000020                  CMP     #20,R4          ;OF SECTOR 0
014250  001372                          BNE     1$              ;BEFORE DOING A SEARCH
014252  012777  000031  164624          MOV     #31,@RSCS1      ;SEARCH
014260  012777  000000  164634          MOV     #0,@RSAS        ;TRY TO CAUSE ERROR
014266  005037  001174                  CLR     WORK            ;CLEAR COUNTER
014272  032777  000200  164616  2$:     BIT     #BIT7,@RSDS     ;WAIT FOR DRY
014300  001004                          BNE     3$              ;READY CONT
014302  005237  001174                  INC     WORK            ;COUNT
014306  001371                          BNE     2$              ;RETRY
014310  104001                          HLT     !CS1            ;RDY NEVER CAME UP
014312  005777  164602          3$:     TST     @RSER           ;DID RMR SET?
014316  001401                          BEQ     .+4             ;NO
014320  104002                          HLT     !ER             ;ER SHOULD = 0
014322  022777  110600  164566          CMP     #110600,@RSDS   ;DID ERR SET?
014330  001401                          BEQ     .+4             ;NO
014332  104042                          HLT     !DS!ER          ;DS SHOULD = 110600
014334  022777  104230  164542          CMP     #104230,@RSCS1  ;IS CS1 CORRECT?
014342  001401                          BEQ     .+4             ;YES
014344  104040                          HLT     !DS             ;CS1 SHOULD = 144260
014346  104414                          CLRDK                   ;CLEAR ALL RS REG
014350  022777  004200  164526          CMP     #4200,@RSCS1    ;IS CS1 CORRECT?
014356  001401                          BEQ     .+4             ;YES
014360  104040                          HLT     !DS             ;NO
```

```
                                ;*****************************************************************************
                                ;TEST 77                        TEST DCK IN RSER
                                ;*****************************************************************************
014362  104400                  TST77:  SCOPE

                                ;DO A WRITE AND THEN A CLEAR FUNCTION THAT SHOULD CAUSE DCK TO SET

014364  104414                  DCKTST: CLRDK                           ;CLEAR ALL RS REG
014366  022737  000004  001162          CMP     #4,RS04DT               ;IS THIS A LA DISK?
014374  001004                        BNE     7$                      ;NO
014376  012737  177640  001200        MOV     #177640,WORK2           ;GET WC FOR LA DISK
014404  000411                        BR      1$                      ;CONTINUE
014406  012737  177500  001200  7$:   MOV     #177500,WORK2           ;GET WC FOR RS04
014414  005737  001162                TST     RS04DT                  ;IS THIS A RS04?
014420  001003                        BNE     1$                      ;YES
014422  012737  177600  001200        MOV     #177600,WORK2           ;NO
014430  013777  001200  164452  1$:   MOV     WORK2,@RSWC             ;LOAD WC
014436  012737  177777  027364        MOV     #-1,OUTBUF              ;WRITE -1
014444  013777  001102  164440        MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
014452  052777  000010  164426  4$:   BIS     #10,@RSCS2              ;SET BAI BIT
014460  012777  000061  164416        MOV     #61,@RSCS1              ;GO WRITE
014466  105777  164412          5$:   TSTB    @RSCS1                  ;IS RDY SET?
014472  100375                        BPL     5$                      ;WAIT FOR WRITE TO FINISH
014474  005077  164414          2$:   CLR     @RSDA                   ;SET DSK ADDRESS TO 0
014500  005037  027364                CLR     OUTBUF                  ;WRITE 0
014504  013777  001102  164400        MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
014512  012777  177777  164370        MOV     #-1,@RSWC               ;LOAD WC
014520  012702  172060                MOV     #172060,R2              ;PUT RSLA ADDR INTO R2
014524  011203          3$:   MOV     (R2),R3                 ;GET LA AND WAIT FOR
014526  042703  000077                BIC     #77,R3                  ;SECTOR 40
014532  022703  004000                CMP     #4000,R3                ;BEFORE
014536  001372                        BNE     3$                      ;WRITING
014540  012777  000061  164336        MOV     #61,@RSCS1              ;GO WRITE
014546  011203          6$:   MOV     (R2),R3                 ;GET RSLA AND WAIT FOR
014550  042703  000017                BIC     #17,R3                  ;MIDDLE OF SECTOR
014554  022703  000020                CMP     #20,R3                  ;0 BEFORE EXECUTING
014560  001372                        BNE     6$                      ;A CLEAR FUNCTION
014562  012777  000040  164316        MOV     #40,@RSCS2              ;CLEAR ALL REG. DO IT THIS WAY
014570  013777  001152  164310        MOV     UNNUM,@RSCS2            ;DO NOT USE TRAP
```

```
2785  014576  105777  164302          INCW:  TSTB   @RSCS1          ;IS BUSY CLEARED
2786  014602  100401                         BMI    6$              ;FLAG CLEARED
2787  014604  104001                         HLT    !CS1            ;RDY NEVER CAME UP
2788  014606  013777  001102  164276  6$:    MOV    @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
2789  014614  013777  001200  164266         MOV    WORK2,@RSWC     ;LOAD WC
2790  014622  012777  000071  164254         MOV    #71,@RSCS1      ;GO READ
2791  014630  105777  164250          5$:    TSTB   @RSCS1          ;IS RDY SET?
2792  014634  100375                         BPL    5$              ;WAIT FOR READ TO FINISH
2793  014636  022777  100000  164254         CMP    #100000,@RSER   ;DID DCK SET?
2794  014644  001401                         BEQ    .+4             ;YES
2795  014646  104002                         HLT    !ER             ;DCK DID NOT SET
2796  014650  022777  150600  164240         CMP    #150600,@RSDS   ;DID ERR SET?
2797  014656  001401                         BEQ    .+4             ;YES
2798  014660  104040                         HLT    !DS             ;ER DID NOT SET BY DCK
2799  014662  022777  144270  164214         CMP    #144270,@RSCS1  ;IS CS1 CORRECT?
2800  014670  001401                         BEQ    .+4             ;YES
2801  014672  104044                         HLT    !DS!DA
2802  014674  017700  164206                 MOV    @RSCS2,BAD      ;GET CS2
2803  014700  013701  001152                 MOV    UNNUM,GOOD      ;GET UNIT #
2804  014704  052701  000100                 BIS    #100,GOOD       ;SET IR
2805  014710  020100                         CMP    GOOD,BAD        ;IS CS2 CORRECT?
2806  014712  001401                         BEQ    .+4             ;YES
2807  014714  104000                         HLT
2808  014716  012701  177700                 MOV    #177700,GOOD    ;NO
2809  014722  017700  164162          1$:    MOV    @RSWC,BAD       ;DID TRANSFER STOP AT END OF SECTOR?
2810  014726  020100                         CMP    GOOD,BAD
2811  014730  001401                         BEQ    .+4             ;YES
2812  014732  104000                         HLT                    ;NO
2813  014734  012701  027364                 MOV    #OUTBUF,GOOD    ;GET BA
2814  014740  022737  000004  001162         CMP    #4,RS04DT       ;LA DISK?
2815  014746  001003                         BNE    7$              ;NO
2816  014750  062701  000100                 ADD    #100,GOOD       ;YES
2817  014754  000410                         BR     3$              ;CONTINUE
2818  014756  005737  001162          7$:    TST    RS04DT          ;RS04?
2819  014762  001003                         BNE    2$              ;YES
2820  014764  062701  000200                 ADD    #200,GOOD       ;RS03
2821  014770  000402                         BR     3$
2822  014772  062701  000400          2$:    ADD    #400,GOOD       ;GET CORRECT ANS FOR BA
2823  014776  017700  164110          3$:    MOV    @RSBA,BAD       ;GET BA
2824  015002  020001                         CMP    BAD,GOOD        ;IS BA CORRECT?
2825  015004  001401                         BEQ    .+4             ;YES
2826  015006  104000                         HLT                    ;NO
2827  015010  104414                         CLRDK                  ;CLEAR ALL RS REG
2828  015012  005777  164102                 TST    @RSER           ;DID DCK CLEAR?
2829  015016  001401                         BEQ    .+4             ;YES
2830  015020  104002                         HLT    !ER             ;DCK DID NOT CLEAR WITH CLEAR
2831  015022  012777  177500  164060         MOV    #177500,@RSWC   ;CLEAR DCK ON
2832  015030  013777  001102  164054         MOV    @#OBUFSV,@RSBA  ;DRIVE BY WRITING
2833  015036  012777  000061  164040         MOV    #61,@RSCS1      ;GOOD DATA
2834  015044  105777  164034          4$:    TSTB   @RSCS1          ;ON DRIVE
2835  015050  100375                         BPL    4$
```

```
                                ;TEST THE ABILITY OF THE DISK CONTROL TO
                                ;INCREMENT THE TRACK REGISTER.
                                
                                ;A ONE WORD WRITE WILL BE EXECUTED
                                ;RSDA=7777 RSWC = -1
                                ;AT THE COMPLETION OF THE WRITE RSDA = 10000
                                ;*****************************************************************************
                                ;TEST 100                TEST DISK ADDRESS REGISTER
                                ;*****************************************************************************
015052  104400                TST100: SCOPE

015054  104414                DKADR:  CLRDK                   ;CLEAR ALL RS REG
015056  012777  177777  164024        MOV     #177777,@RSWC   ;SET WORD COUNT TO -1
015064  013777  001102  164020        MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
015072  012777  007777  164014        MOV     #7777,@RSDA     ;SET RSDA TO ALL ONES
015100  012777  000061  163776        MOV     #61,@RSCS1      ;GO WRITE ONE WORD
015106  004737  026600                JSR     PC,WAITRY       ;WAIT FOR READY
015112  104001                        HLT     !CS1            ;RDY DID NOT COME UP
015114  027727  163774  010000  5$:   CMP     @RSDA,#10000    ;DOES RSDA=0
015122  001401                        BEQ     .+4             ;RSDA OK
015124  104004                        HLT     !DA             ;DA DID NOT INCREMENT

                                ;*****************************************************************************
                                ;TEST 101                TEST IAE ERROR
                                ;*****************************************************************************
015126  104400                TST101: SCOPE

                                ;IAE ERROR SHOULD SET ERR,ATA AND SC BITS

015130  104414                IAERR:  CLRDK                   ;CLEAR ALL RS REG
015132  012777  177777  163750        MOV     #177777,@RSWC   ;SET WC TO -1
015140  013777  001102  163744        MOV     @#OBUFSV,@RSBA  ;SET UP BUS ADDRESS
015146  012777  017777  163740        MOV     #17777,@RSDA    ;SET DA TO RECEIVE ERROR
015154  012777  000061  163722        MOV     #61,@RSCS1      ;GO WRITE ONE WD
015162  105777  163716        7$:     TSTB    @RSCS1          ;TEST FOR ERR OR RDY
015166  100401                        BMI     .+4             ;OK CONT.
015170  000774                        BR      7$              ;WAIT
015172  022777  002000  163720        CMP     #2000,@RSER     ;DID IAE SET?
015200  001401                        BEQ     .+4             ;YES
015202  104002                        HLT     !ER             ;IAE SHOULD BE SET
015204  022777  150600  163704        CMP     #150600,@RSDS   ;DID ERR SET?
015212  001401                        BEQ     .+4             ;YES
015214  104140                        HLT     !DS!AS          ;ERR SHOULD BE SET
015216  022777  144260  163660        CMP     #144260,@RSCS1  ;DID SC SET?
015224  001401                        BEQ     .+4             ;YES
015226  104001                        HLT     !CS1            ;SC SHOULD BE SET
015230  104414                        CLRDK                   ;CLEAR ALL RS REG
015232  005777  163662                TST     @RSER           ;CLR ERRORS?
015236  001401                        BEQ     .+4             ;YES
015240  104002                        HLT     !ER             ;ERR DID NOT CLR WITH 40 IN CS2
```

```
                                        ;IN THIS ROUTINE THE PROGRAM WILL GENERATE A
                                        ;NON-EXISTENT DISK ERROR
                                        ;
                                        ;*************************************************************
                                        ;TEST 102                TEST FOR NON=EXISTENT DISK ERROR
                                        ;*************************************************************
015242  104400                          TST102: SCOPE
                                        ;
015244  104414                  NEDTST: CLRDK                           ;CLEAR ALL RS REG
015246  012737  000401  001174          MOV     #401,WORK               ;SET UP FOR N.E.D. NUMBER
015254  005001                          CLR     GOOD                    ;LOOK FOR NON EXISTENT DRIVES
015256  033737  001174  001154  1$:     BIT     WORK,UNITSV             ;ON THE SYSTEM
015264  001405                          BEQ     3$                      ;FOUND NON EXISTENT DRIVE
015266  005201                          INC     GOOD                    ;CONTAINS UNIT #
015270  006137  001174                  ROL     WORK                    ;KEEP LOOKING
015274  103452                          BCS     NEDDON                  ;COULD NOT FIND ANY NON EXISTENT DRIVES
015276  000767                          BR      1$                      ;LOOK FOR NED
015300  010177  163602          3$:     MOV     GOOD,@RSCS2             ;LOAD NED IN CS2
015304  005077  163604                  CLR     @RSDA                   ;WRITE DRIVE REG
015310  005777  163604                  TST     @RSER                   ;DID ANY BITS SET IN RSER?
015314  001401                          BEQ     .+4                     ;NO
015316  104040                          HLT     !DS                     ;WHY DID RSER CHANGE?
015320  017700  163562                  MOV     @RSCS2,BAD              ;GET CS2
015324  052701  010100                  BIS     #10100,GOOD             ;SET NED AND IR
015330  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
015332  001401                          BEQ     .+4                     ;YES
015334  104000                          HLT                             ;GOOD=CORRECT CS2 BAD=CS2
015336  022777  160200  163540          CMP     #160200,@RSCS1          ;IS CS1 CORRECT?
015344  001401                          BEQ     .+4                     ;YES
015346  104200                          HLT     !CS2                    ;TRE SHOULD SET BY NED ERROR
015350  005777  163546                  TST     @RSAS                   ;DID ANY BITS SET?
015354  001401                          BEQ     .+4                     ;NO
015356  104100                          HLT     !AS                     ;WHY DID AT BITS SET?
015360  112777  000100  163552          MOVB    #100,@RSCS1B            ;CLEAR TRE
015366  032777  010000  163512          BIT     #NED,@RSCS2             ;DID NED CLEAR
015374  001401                          BEQ     .+4                     ;YES
015376  104200                          HLT     !CS2                    ;NED DID NOT CLEAR
015400  017737  163510  001174          MOV     @RSDA,WORK              ;READ DRIVE REG
015406  032777  010000  163472          BIT     #NED,@RSCS2             ;DID NED SET?
015414  001001                          BNE     .+4
015416  104040                          HLT     !DS                     ;NED DID NOT SET
015420  000431                          BR      NNDD                    ;GET OUT
015422  032737  010000  001160  NEDDON: BIT     #BIT12,ONCEE            ;DWAS THIS TYPED BEFORE?
015430  001025                          BNE     NNDD                    ;YES
015432  104402  015436                  TYPE    ,.+2                    ;.ASCIZ <15><12>"COULD NOT FIND A NON-EXISTENT DRIVE"
015504  052737  010000  001160  NNDD:   BIS     #BIT12,ONCEE            ;SET TYPED FLAG
```

```
                                ;*****************************************************************************
                                ;TEST 103                TEST THAT DAO IN RSER AND LBT IN RSDS DO SET
                                ;*****************************************************************************
015512  104400                  TST103: SCOPE

015514  104414                  DAOTST: CLRDK                           ;CLEAR ALL RS REG
015516  022737  000004  001162          CMP     #4,RS04DT               ;RS03LA?
015524  001004                        BNE     3$                      ;NO
015526  012777  177737  163354        MOV     #-41,@RSWC              ;LOAD WORD COUNT
015534  000411                        BR      1$                      ;CONT
015536  012777  177577  163344  3$:   MOV     #-201,@RSWC             ;LOAD WC FOR RS04
015544  005737  001162                TST     RS04DT                  ;IS THIS A RS04?
015550  001003                        BNE     1$                      ;YES
015552  012777  177677  163330        MOV     #-101,@RSWC             ;NO
015560  012777  007777  163326  1$:   MOV     #7777,@RSDA             ;SET RSDA=TO ALL ONES
015566  013777  001102  163316  2$:   MOV     @#OBUFSV,@RSBA          ;CURRENT ADDRESS=OUTBUF
015574  012777  000061  163302        MOV     #61,@RSCS1              ;WRITE
015602  004737  026600                JSR     PC,WAITRY               ;WAIT FOR READY
015606  104001                        HLT     !CS1                    ;RDY DID NOT SET
015610  022777  001000  163302        CMP     #1000,@RSER             ;DID DAO SET?
015616  001401                        BEQ     .+4                     ;YES
015620  104002                        HLT     !ER                     ;DAO DID NOT SET
015622  022777  152600  163266        CMP     #152600,@RSDS           ;DID LBT SET?
015630  001401                        BEQ     .+4                     ;YES
015632  104040                        HLT     !DS                     ;LBT DID NOT SET
015634  005777  163244                TST     @RSCS1                  ;IS ERROR FLAG SET
015640  100401                        BMI     .+4                     ;ERROR IS SET
015642  104001                        HLT     !CS1                    ;SC DID NOT SET
015644  104414                        CLRDK                           ;CLEAR ALL RS REG
015646  022777  010600  163242        CMP     #10600,@RSDS            ;DID ATA +LBT CLEAR
015654  001401                        BEQ     .+4                     ;YES
015656  104040                        HLT     !DS                     ;ATA DID NOT CLEAR BY CLR BIT
015660  005777  163234                TST     @RSER                   ;DID DAO CLEAR?
015664  001401                        BEQ     .+4                     ;YES
015666  104002                        HLT     !ER                     ;DAO DID NOT CLEAR WITH CLEAR
```

```
                                ;*****************************************************************************
                                ;TEST 104                TEST THAT LBT DOES SET AND DAO DOES NOT
                                ;*****************************************************************************
015670  104400                  TST104: SCOPE

015672  104414          DAOTT:  CLRDK                           ;CLEAR ALL RS REG
015674  022737  000004  001162          CMP     #4,RS04DT       ;RS03LA?
015702  001004                  BNE     3$                      ;NO
015704  012777  177741  163176          MOV     #-37,@RSWC      ;LOAD WORD COUNT
015712  000411                  BR      1$                      ;CONT
015714  012777  177601  163166  3$:     MOV     #-177,@RSWC     ;LOAD WC FOR RS04
015722  005737  001162                  TST     RS04DT          ;IS THIS A RS04?
015726  001003                  BNE     1$                      ;YES
015730  012777  177701  163152          MOV     #-77,@RSWC      ;NO
015736  012777  007777  163150  1$:     MOV     #7777,@RSDA     ;SET RSDA=TO ALL ONES
015744  013777  001102  163140  2$:     MOV     @#OBUFSV,@RSBA  ;CURRENT ADDRESS=OUTBUF
015752  012777  000061  163124          MOV     #61,@RSCS1      ;WRITE
015760  004737  026600                  JSR     PC,WAITRY       ;WAIT FOR READY
015764  104001                  HLT     !CS1                    ;RDY DID NOT SET
015766  005777  163126                  TST     @RSER           ;ANY ERRORS?
015772  001401                  BEQ     .+4                     ;NO
015774  104002                  HLT     !ER                     ;YES
015776  022777  012600  163112          CMP     #12600,@RSDS    ;DID LBT SET?
016004  001401                  BEQ     .+4                     ;YES
016006  104040                  HLT     !DS                     ;LBT DID NOT SET
016010  005777  163070                  TST     @RSCS1          ;IS ERROR FLAG SET
016014  100001                  BPL     .+4                     ;NO
016016  104001                  HLT     !CS1                    ;ERROR
016020  104414                  CLRDK                           ;CLEAR ALL RS REG
016022  022777  010600  163066          CMP     #10600,@RSDS    ;DID LBT CLEAR
016030  001401                  BEQ     .+4                     ;YES
016032  104040                  HLT     !DS                     ;ATA DID NOT CLEAR BY CLR BIT
```

```
                                ;*****************************************************************************
                                ;TEST 105                EXECUTE FUNCTION WITH ERROR BITS SET
                                ;*****************************************************************************
016034  104400                  TST105: SCOPE

016036  104414                  ERTST:  CLRDK                   ;CLEAR ALL RS REG
016040  012777  177017  163052          MOV     #177017,@RSER   ;LOAD ER
016046  017700  163050          MOV     @RSAS,BAD       ;GET AS REG
016052  013701  001156          MOV     UNCMP,GOOD      ;GET UNIT ATA BIT
016056  042701  177400          BIC     #177400,GOOD    ;CLEAR JUNK
016062  020100                  CMP     GOOD,BAD        ;IS AS REG CORRECT?
016064  001401                  BEQ     .+4             ;YES
016066  104100                  HLT     !AS             ;AS BIT SHOULD BE SET
016070  022777  104200  163006          CMP     #104200,@RSCS1  ;DID ERRS SET IN CS1?
016076  001401                  BEQ     .+4             ;YES
016100  104040                  HLT     !DS             ;CS1 SHOULD =104200
016102  013777  001156  163012          MOV     UNCMP,@RSAS     ;CLEAR ATA BIT
016110  005777  163006          TST     @RSAS           ;DID IT CLEAR?
016114  001401                  BEQ     .+4             ;YES
016116  104100                  HLT     !AS             ;COULD NOT CLEAR AS BIT
                                                        ;BY LOADING A 1 INTO IT
016120  022777  004200  162756          CMP     #4200,@RSCS1    ;DID SC CLEAR BY
016126  001401                  BEQ     .+4             ;CLEARING ATA
016130  104002                  HLT     !ER             ;NO
016132  012737  177777  027364          MOV     #177777,OUTBUF  ;DATA TO BE XFERED
016140  013777  001102  162744          MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
016146  012777  177777  162734          MOV     #-1,@RSWC       ;LOAD WC WITH -1
016154  012777  000071  162722          MOV     #71,@RSCS1      ;DO READ FUNCTION
016162  032777  000001  162714          BIT     #1,@RSCS1       ;DID GO BIT CLEAR
016170  001401                  BEQ     .+4             ;YES
016172  104001                  HLT     !CS1            ;GO BIT SHOULD BE CLEARED
016174  105777  162704          1$:     TSTB    @RSCS1          ;WAIT FOR READY
016200  100375                  BPL     1$              ;WAIT
016202  022777  144270  162674          CMP     #144270,@RSCS1  ;DID ERRS CLEAR BY SETTING GO BIT?
016210  001401                  BEQ     .+4             ;YES
016212  104002                  HLT     !ER             ;NO
```

```
 3035  016214  017700  162666                MOV     @RSCS2,BAD      ;GET CS2
 3036  016220  012701  001100                MOV     #1100,GOOD      ;GET CORRECT ANS
 3037  016224  053701  001152                BIS     UNNUM,GOOD      ;GET UNIT #
 3038  016230  020100                        CMP     GOOD,BAD        ;IS CS2 CORRECT?
 3039  016232  001401                        BEQ     .+4             ;YES
 3040  016234  104000                        HLT                     ;GOOD = WHAT CS2 SHOULD =
 3041  016236  022777  150600  162652        CMP     #150600,@RSDS   ;DID ERR BITS SET?
 3042  016244  001401                        BEQ     .+4             ;NO
 3043  016246  104040                        HLT     !DS             ;ERR BIT SHOULD BE 1
 3044  016250  022777  177777  162632        CMP     #-1,@RSWC       ;DID WC MOVE?
 3045  016256  001401                        BEQ     .+4             ;NO
 3046  016260  104010                        HLT     !WC             ;WC SHOULD = 1777777
 3047  016262  005777  162626                TST     @RSDA           ;DID DA MOV
 3048  016266  001401                        BEQ     .+4             ;NO
 3049  016270  104004                        HLT     !DA             ;DA SHOULD =0
 3050  016272  023777  001102  162612        CMP     @#OBUFSV,@RSBA  ;DID BA MOVE
 3051  016300  001401                        BEQ     .+4             ;NO
 3052  016302  104020                        HLT     !BA             ;BA MOVED
 3053  016304  033777  001156  162610        BIT     UNCMP,@RSAS     ;AS SHOULD BE SET
 3054  016312  001001                        BNE     .+4             ;IS IT?
 3055  016314  104100                        HLT     !AS             ;NO
 3056  016316  022777  177017  162574        CMP     #177017,@RSER   ;DID ER CHANGE?
 3057  016324  001401                        BEQ     .+4             ;NO
 3058  016326  104002                        HLT     !ER             ;ER SHOULD NOT CHANGE
```

```
3059                                    ;*************************************************************************
3060                                    ;TEST 106                PAT AND MCPE TEST
3061                                    ;*************************************************************************
3062  016330  104400                    TST106: SCOPE
3063
3064  016332  104414                    PATST:  CLRDK                           ;CLEAR ALL RS REG
3065  016334  052777  000020  162544            BIS     #BIT4,@RSCS2            ;SET PAT
3066  016342  005777  162562                    TST     @RSMR                   ;READ DRIVE REG
3067  016346  017700  162534                    MOV     @RSCS2,BAD              ;GET CS2
3068  016352  012701  000120                    MOV     #120,GOOD               ;MDPE SHOULD
3069  016356  053701  001152                    BIS     UNNUM,GOOD              ;NOT SET
3070  016362  020100                            CMP     GOOD,BAD                ;IS CS2 CORRECT?
3071  016364  001401                            BEQ     .+4                     ;YES
3072  016366  104000                            HLT                             ;BAD = CS2 GOOD = CORRECT ANS
3073  016370  012777  000010  162532            MOV     #10,@RSMR               ;CAUSE PAR TO SET IN RSER
3074  016376  022777  000010  162514            CMP     #10,@RSER               ;DID PAR SET?
3075  016404  001401                            BEQ     .+4                     ;YES
3076  016406  104140                            HLT     !AS!DS
3077  016410  017700  162506                    MOV     @RSAS,BAD               ;GET AS REG
3078  016414  013701  001156                    MOV     UNCMP,GOOD              ;GET UNIT ATA BIT
3079  016420  042701  177400                    BIC     #177400,GOOD            ;CLEAR JUNK
3080  016424  020100                            CMP     GOOD,BAD                ;IS AS REG CORRECT?
3081  016426  001401                            BEQ     .+4                     ;YES
3082  016430  104100                            HLT     !AS                     ;AS BIT SHOULD BE SET
3083  016432  022777  104200  162444            CMP     #104200,@RSCS1          ;DID ERRS SET IN CS1?
3084  016440  001401                            BEQ     .+4                     ;YES
3085  016442  104040                            HLT     !DS                     ;CS1 SHOULD =104200
3086  016444  104414                            CLRDK                           ;CLEAR RS REG
3087  016446  022777  004200  162430            CMP     #4200,@RSCS1            ;IS CS1 CORRECT?
3088  016454  001401                            BEQ     .+4                     ;CLEARING ATA
3089  016456  104002                            HLT     !ER                     ;NO
3090  016460  017700  162422                    MOV     @RSCS2,BAD              ;CHECK TO SEE
3091  016464  013701  001152                    MOV     UNNUM,GOOD              ;IF PAT CLEARS
3092  016470  052701  000100                    BIS     #100,GOOD
3093  016474  020100                            CMP     GOOD,BAD
3094  016476  001401                            BEQ     .+4
3095  016500  104000                            HLT                             ;PAT DID NOT CLEAR
```

```
                                ;*****************************************************************************
                                ;TEST 107                   SET PAT BIT AND LOAD FUNCTION
                                ;*****************************************************************************
016502  104400                  TST107: SCOPE

016504  104414                  SETPAT: CLRDK                           ;CLEAR ALL REG
016506  052777  000010  162372          BIS     #BAI,@RSCS2             ;SET BAI
016514  012737  177777  027364          MOV     #177777,OUTBUF          ;DATA TO BE XFERED
016522  013777  001102  162362          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
016530  012777  177000  162352          MOV     #-1000,@RSWC            ;LOAD WC WITH -1
016536  052777  000020  162342          BIS     #BIT4,@RSCS2            ;SET PAT BIT
016544  012777  000071  162332          MOV     #71,@RSCS1              ;DO READ FUNCTION
016552  105777  162326          1$:     TSTB    @RSCS1                  ;WAIT FOR READY
016556  100375                          BPL     1$                      ;WAIT
016560  022777  144270  162316          CMP     #144270,@RSCS1          ;DID CS1 GET LOADED?
016566  001401                          BEQ     .+4                     ;NO
016570  104040                          HLT     !DS                     ;IT SHOULD NOT
016572  023777  001102  162312          CMP     @#OBUFSV,@RSBA          ;DID BA MOVE?
016600  001401                          BEQ     .+4                     ;NO
016602  104020                          HLT     !BA                     ;YES
016604  022777  177000  162276          CMP     #-1000,@RSWC            ;DID WC MOVE?
016612  001401                          BEQ     .+4                     ;NO
016614  104010                          HLT     !WC                     ;YES WHY?

                                ;*****************************************************************************
                                ;TEST 110                   DO FUNCTION THEN SET PAT BIT
                                ;*****************************************************************************
016616  104400                  TST110: SCOPE
016620  104414                  FUNDO:  CLRDK                           ;CLEAR ALL REG
016622  052777  000010  162256          BIS     #BAI,@RSCS2             ;SET BAI
016630  012737  177777  027364          MOV     #177777,OUTBUF          ;DATA TO BE XFERED
016636  013777  001102  162246          MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
016644  012777  177000  162236          MOV     #-1000,@RSWC            ;LOAD WC WITH -1
016652  012777  000071  162224  3$:     MOV     #71,@RSCS1              ;DO A READ
016660  100774                          BMI     3$                      ;WAIT FOR BUSY
016662  052777  000020  162216          BIS     #BIT4,@RSCS2            ;SET PAT
016670  105777  162210          2$:     TSTB    @RSCS1                  ;WAIT FOR READY
016674  100375                          BPL     2$
016676  022777  144270  162200          CMP     #144270,@RSCS1          ;DID MCPE SET?
016704  001401                          BEQ     .+4                     ;NO
016706  104002                          HLT     !ER                     ;YES
016710  017700  162172                  MOV     @RSCS2,BAD              ;GET CS2
016714  012701  000730                  MOV     #730,GOOD               ;GET CORRECT ANS
016720  053701  001152                  BIS     UNNUM,GOOD              ;GET UNIT #
016724  020100                          CMP     GOOD,BAD                ;IS CS2 CORRECT?
016726  001401                          BEQ     .+4                     ;YES
016730  104000                          HLT                             ;GOOD = WHAT CS2 SHOULD =
```

```
3143  016732  022777  010600  162156          CMP     #10600,@RSDS    ;DID ERR BITS SET?
3144  016740  001401                          BEQ     .+4             ;NO
3145  016742  104040                          HLT     !DS             ;ERR BIT SHOULD BE 1
3146  016744  005777  162150                  TST     @RSER           ;IS ER CLEAR?
3147  016750  001401                          BEQ     .+4             ;YES
3148  016752  104044                          HLT     !DS!DA          ;NO ERRORS SHOULD BE SET
3149  016754  104414                          CLRDK                   ;CLEAR ALL RS REG
3150  016756  022777  004200  162120          CMP     #4200,@RSCS1    ;IS CS1 CORRECT?
3151  016764  001401                          BEQ     .+4             ;YES
3152  016766  104040                          HLT     !DS
3153                        ;*************************************************************************
3154                        ;TEST 111                       TEST PAR BY SETTING PAT
3155                        ;*************************************************************************
3156  016770  104400                  TST111: SCOPE
3157
3158  016772  104414                  PATTST: CLRDK                   ;CLEAR ALL RS REG
3159  016774  052777  000010  162104          BIS     #BAI,@RSCS2     ;SET BAI
3160  017002  012737  177777  027364          MOV     #177777,OUTBUF  ;DATA TO BE XFERED
3161  017010  013777  001102  162074          MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
3162  017016  012777  177000  162064          MOV     #-1000,@RSWC    ;LOAD WC WITH -1
3163  017024  012777  000061  162052          MOV     #61,@RSCS1      ;DO WRITE FUNCTION
3164  017032  105777  162046          1$:     TSTB    @RSCS1          ;WAIT FOR READY
3165  017036  100775                          BMI     1$              ;WAIT
3166  017040  052777  000020  162040          BIS     #BIT4,@RSCS2    ;SET PAT
3167  017046  105777  162032          2$:     TSTB    @RSCS1          ;WAIT FOR READY
3168  017052  100375                          BPL     2$
3169  017054  022777  144260  162022          CMP     #144260,@RSCS1  ;DID MCPE SET?
3170  017062  001401                          BEQ     .+4             ;NO
3171  017064  104002                          HLT     !ER             ;YES
3172  017066  017700  162014                  MOV     @RSCS2,BAD      ;GET CS2
3173  017072  012701  000230                  MOV     #230,GOOD       ;GET CORRECT ANS-- DO NOT CHECK IR - REASON 50 CYCLE
3174  017076  053701  001152                  BIS     UNNUM,GOOD      ;GET UNIT #
3175  017102  042700  000100                  BIC     #BIT6,BAD       ;CLEAR IR BIT FOR CS2 COMPARE
3176  017106  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT?
3177  017110  001401                          BEQ     .+4             ;YES
3178  017112  104000                          HLT                     ;GOOD = WHAT CS2 SHOULD =
3179  017114  022777  150600  161774          CMP     #150600,@RSDS   ;DID ERR BITS SET?
3180  017122  001401                          BEQ     .+4             ;NO
3181  017124  104040                          HLT     !DS             ;ERR BIT SHOULD BE 1
3182  017126  022777  000010  161764          CMP     #10,@RSER       ;DID PAR SET?
3183  017134  001401                          BEQ     .+4             ;YES
3184  017136  104044                          HLT     !DS!DA          ;NO
3185  017140  104414                          CLRDK                   ;CLEAR ALL RS REG
3186  017142  022777  004200  161734          CMP     #4200,@RSCS1    ;IS CS1 CORRECT?
3187  017150  001401                          BEQ     .+4             ;YES
3188  017152  104040                          HLT     !DS
3189  017154  005777  161740                  TST     @RSER           ;DID PAR CLEAR?
3190  017160  001401                          BEQ     .+4             ;YES
3191  017162  104040                          HLT     !DS
```

```
3192                                    ;*************************************************************************
3193                                    ;TEST 112                TEST THE ABILITY TO FILL THE LAST SECTOR
3194                                    ;*************************************************************************
3195  017164  104400                    TST112: SCOPE
3196
3197  017166  104414            LASTSC: CLRDK                           ;CLEAR ALL RS REG
3198  017170  012777  007777  161716          MOV     #7777,@RSDA       ;SET RSDA=TO ALL ONES
3199  017176  022737  000004  001162          CMP     #4,RS04DT         ;LA DISK?
3200  017204  001004                         BNE     2$                ;NO
3201  017206  012777  177740  161674          MOV     #-40,@RSWC        ;LOAD WORD COUNT
3202  017214  000411                         BR      1$                ;CONTINUE
3203  017216  012777  177700  161664  2$:     MOV     #-100,@RSWC       ;WORD COUNT=-100
3204  017224  005737  001162                  TST     RS04DT            ;IS THIS A RS04?
3205  017230  001403                         BEQ     1$                ;NO
3206  017232  012777  177600  161650          MOV     #-200,@RSWC       ;YES
3207  017240  013777  001102  161644  1$:     MOV     @#OBUFSV,@RSBA    ;CURRENT ADDRESS=OUTBUF
3208  017246  012777  000061  161630          MOV     #61,@RSCS1        ;WRITE
3209  017254  004737  026600                  JSR     PC,WAITRY         ;WAIT FOR READY
3210  017260  104001                         HLT     !CS1              ;RDY DID NOT SET
3211  017262  005777  161632                  TST     @RSER             ;DID ANY ERROR BITS SET?
3212  017266  001401                         BEQ     .+4               ;NO
3213  017270  104002                         HLT     !ER               ;GOT AN ERROR
3214  017272  022777  012600  161616          CMP     #12600,@RSDS      ;DID LBT SET?
3215  017300  001401                         BEQ     .+4               ;YES
3216  017302  104040                         HLT     !DS               ;LBT DID NOT SET
3217  017304  005777  161574                  TST     @RSCS1            ;IS ERROR FLAG SET
3218  017310  100001                         BPL     .+4               ;ERROR IS SET
3219  017312  104001                         HLT     !CS1              ;SC DID NOT SET
3220  017314  104414                         CLRDK                     ;CLEAR ALL RS REG
3221  017316  022777  010600  161572          CMP     #10600,@RSDS      ;DID ATA +LBT CLEAR
3222  017324  001401                         BEQ     .+4               ;YES
3223  017326  104040                         HLT     !DS               ;ATA DID NOT CLEAR BY CLR BIT
```

```
                                        ;FILL SECTOR WITH ALL ONES.
                                        ;NOW WRITE 1ST WORD IN SECTOR
                                        ;TEST REMAINING 63 WORDS FOR 0

                                        ;*****************************************************************************
                                        ;TEST 113                 TEST FOR ZERO'S IN PARTIAL FILLED SECTOR
                                        ;*****************************************************************************
017330  104400                          TST113: SCOPE
017332  104414                          SECT:   CLRDK                           ;CLEAR ALL RS REG
017334  012737  177777  027364                  MOV     #-1,OUTBUF              ;PUT -1NTO OUTBUF
017342  013777  001102  161542                  MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDR
017350  022737  000004  001162                  CMP     #4,RS04DT               ;RS03LA DISK?
017356  001004                                  BNE     4$                      ;NO
017360  012777  177740  161522                  MOV     #-40,@RSWC              ;LOAD WORD COUNT
017366  000411                                  BR      5$                      ;CONTINUE
017370  012777  177600  161512          4$:     MOV     #-200,@RSWC             ;LOAD WC FOR RS04
017376  005737  001162                          TST     RS04DT                  ;RS04?
017402  001003                                  BNE     5$                      ;YES
017404  012777  177700  161476                  MOV     #-100,@RSWC             ;SET WORD COUNT TO -100
017412  052777  000010  161466          5$:     BIS     #BAI,@RSCS2             ;SET BAI BIT
017420  012777  000061  161456                  MOV     #61,@RSCS1              ;WRITE
017426  105777  161452                  3$:     TSTB    @RSCS1                  ;IS RDY SET?
017432  100375                                  BPL     3$                      ;NO
017434  005077  161454                          CLR     @RSDA                   ;SET DSK ADDRESS TO 0
017440  012737  177777  027364                  MOV     #-1,OUTBUF              ;PUT 177777 INTO OUTBUF
017446  013777  001102  161436                  MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDR
017454  012777  177777  161426                  MOV     #-1,@RSWC               ;SET WORD COUNT TO -1
017462  052777  000010  161416                  BIS     #10,@RSCS2              ;SET BAI BIT
017470  012777  000061  161406                  MOV     #61,@RSCS1              ;WRITE
017476  105777  161402                  1$:     TSTB    @RSCS1                  ;IS RDY SET?
017502  100375                                  BPL     1$                      ;NO
017504  042777  000010  161374                  BIC     #10,@RSCS2              ;CLEAR BAI BIT
017512  005737  001162                          TST     RS04DT                  ;RS04?
017516  001404                                  BEQ     7$                      ;NO
017520  012737  000200  001174                  MOV     #200,WORK               ;YES
017526  000403                                  BR      8$                      ;CONT
017530  012737  000100  001174          7$:     MOV     #100,WORK               ;SET UP BUFFER
017536  013701  001102                  8$:     MOV     @#OBUFSV,R1             ;GET STARTING ADD OF BUF
017542  012721  177777                          MOV     #-1,(R1)+               ;LOAD FIRST WD WITH -1
017546  005021                          6$:     CLR     (R1)+                   ;LOAD REST WITH 0
017550  005337  001174                          DEC     WORK                    ;DONE YET?
017554  001374                                  BNE     6$                      ;NO
017556  005077  161332                          CLR     @RSDA                   ;SET DSK ADDRESS TO 0
017562  013777  001102  161322                  MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDR
017570  022737  000004  001162                  CMP     #4,RS04DT               ;RS03LA DISK?
017576  001004                                  BNE     11$                     ;NO
017600  012777  177740  161302                  MOV     #-40,@RSWC              ;LOAD WORD COUNT
017606  000412                                  BR      10$                     ;CONTINUE
017610  005737  001162                  11$:    TST     RS04DT                  ;RS04?
017614  001404                                  BEQ     9$                      ;NO
017616  012777  177600  161264                  MOV     #-200,@RSWC             ;YES
017624  000403                                  BR      10$                     ;CONT
017626  012777  177700  161254          9$:     MOV     #-100,@RSWC             ;SET WORD COUNT TO -100
017634  012777  000051  161242          10$:    MOV     #51,@RSCS1              ;WRITE CHECK
```

```
3278  017642  032777  000200  161234  2$:     BIT     #200,@RSCS1     ;IS RDY SET?
3279  017650  001774                          BEQ     2$              ;NO
3280  017652  013701  001152                  MOV     UNNUM,GOOD      ;GET UNIT #
3281  017656  052701  000100                  BIS     #100,GOOD       ;SET IR BIT
3282  017662  017700  161220                  MOV     @RSCS2,BAD      ;GET CS2
3283  017666  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT?
3284  017670  001401                          BEQ     .+4             ;YES
3285  017672  104002                          HLT     !ER             ;THERE WAS A WRITE CHECK ERROR
3286
3287                                  ;*************************************************************************
3288                                  ;TEST 114                IF MEMORY MANAGEMENT IS AVAILABLE CHECK THE EXTENDED MEMORY ADDR
3289                                  ;*************************************************************************
3290  017674  104400                  TST114: SCOPE
3291
3292  017676  104414                  EXTTST: CLRDK                           ;CLEAR ALL RS REG.
3293  017700  013737  022414  001164          MOV     TIMES,TIMSV     ;SAVE LOOP #
3294  017706  012737  000010  022414          MOV     #10,TIMES       ;LOOP 10 TIMES
3295  017714  012737  020420  000004          MOV     #EXTTRP,4       ;SETUP TIMEOUT TRAP
3296  017722  012737  000340  000006          MOV     #340,6
3297  017730  005737  177572                  TST     @#SR0           ;IF MEMORY MANAGEMENT IS NOT
3298                                                                  ;AVAILABLE THE PROGRAM WILL TRAP
3299                                                                  ;AND TRANSFER TO END OF THE TEST
3300  017734  012737  020412  000004          MOV     #EXTRP,4
3301  017742  012737  007600  172356          MOV     #7600,@#KIPAR7  ;OPEN I/O REGISTERS
3302  017750  005037  172340                  CLR     @#KIPAR0        ;FREE FIRST 4K
3303  017754  012737  000200  172342          MOV     #200,@#KIPAR1   ;ENABLE SECOND 4K
3304  017762  012737  002000  172344          MOV     #2000,@#KIPAR2
3305  017770  012737  177406  172300          MOV     #400*256.-400+UP+RW,@#KIPDR0    ;SET KIPDR0=RW UP 400 BLOCKS
3306  017776  012737  177406  172302          MOV     #400*256.-400+UP+RW,@#KIPDR1    ;SET KIPDR1=RW UP 400 BLOCKS
3307  020004  012737  177406  172304          MOV     #400*256.-400+UP+RW,@#KIPDR2    ;SET KIPDR2=RW UP 400 BLOCKS
3308  020012  012737  177406  172316          MOV     #400*256.-400+UP+RW,@#KIPDR7    ;SET KIPDR7=RW UP 400 BLOCKS
3309  020020  012737  000001  177572          MOV     #1,@#SR0        ;TURN ON MEMORY MANAGEMENT
3310  020026  012702  040000                  MOV     #40000,R2       ;R2 EQUALS BASE ADDR
```

```
3311  020032  012712  177777          7$:   MOV   #177777,(R2)    ;INSERT PATTERN INTO 200000
3312  020036  012777  177776  161044        MOV   #-2,@RSWC       ;SETUP WORDCOUNT
3313  020044  012777  177777  161040        MOV   #177777,@RSBA   ;SETUP BUS ADDR
3314  020052  012777  000061  161024        MOV   #61,@RSCS1      ;WRITE TWO WORDS ON DISK.  RSBA
3315                                                              ;STARTS AT 177777 TO FORCE CARRY
3316                                                              ;TO SET A16
3317  020060  105777  161020               TSTB  @RSCS1          ;WAIT FOR READY
3318  020064  100375                       BPL   .-4
3319  020066  005777  161012               TST   @RSCS1
3320  020072  100002                       BPL   1$
3321  020074  104046                       HLT   !ER!DA!DS       ;STATUS ERROR AFTER 2 WORD WRITE
3322  020076  000447                       BR    2$              ;USING MEX0
3323  020100  022777  004660  160776  1$:  CMP   #4660,@RSCS1    ;IS CS1 CORRECT
3324  020106  001402                       BEQ   3$              ;YES
3325  020110  104002                       HLT   !ER             ;CS2 DID NOT COMPARE
3326  020112  000441                       BR    2$
3327  020114  005012                 3$:   CLR   (R2)            ;CLEAR LOCATION 200000
3328  020116  005077  160772               CLR   @RSDA           ;SETUP DA
3329  020122  012777  177777  160762        MOV   #177777,@RSBA   ;SETUP BA
3330  020130  012777  177776  160752        MOV   #-2,@RSWC       ;SETUP WC
3331  020136  012777  000071  160740        MOV   #71,@RSCS1      ;READ TWO WORDS INTO LOCATIONS
3332                                                              ;177777 AND 200000.
3333  020144  105777  160734               TSTB  @RSCS1          ;WAIT FOR READY
3334  020150  100375                       BPL   .-4
3335  020152  005777  160726               TST   @RSCS1          ;ANY ERRORS?
3336  020156  100002                       BPL   4$              ;BRANCH IF NO
3337  020160  104002                       HLT   !ER             ;ERROR OFTER READING 2 WORDS
3338  020162  000415                       BR    2$
3339  020164  022777  004670  160712  4$:  CMP   #4670,@RSCS1    ;IS CS1 CORRECT?
3340  020172  001402                       BEQ   5$              ;YES
3341  020174  104002                       HLT   !ER             ;CS1 DID NOT COMPARE
3342  020176  000407                       BR    2$              ;READ STARTING AT 177777
3343  020200  022712  177777          5$:  CMP   #177777,(R2)    ;WAS DATA READ INTO LOCATION
3344  020204  001404                       BEQ   2$              ;200000 CORRECTLY? - BRANCH IF YES
3345  020206  012701  177777               MOV   #177777,GOOD
3346  020212  011200                       MOV   (R2),BAD
3347  020214  104000                       HLT                   ;DATA COMPARE ERROR AT 200000
3348  020216  000240                 2$:   NOP
```

```
3349  020220  104414                    EXTT1:  CLRDK                   ;CLEAR ALL REG
3350  020222  012737  004000  172344            MOV     #4000,@#KIPAR2
3351  020230  012702  040000                    MOV     #40000,R2       ;R2 EQUALS THE BASE ADDR
3352  020234  012712  177777            7$:     MOV     #177777,(R2)    ;INSERT PATTERN INTO 400000
3353  020240  012777  177777  160644            MOV     #177777,@RSBA   ;SETUP BUS ADDR
3354  020246  012777  177776  160634            MOV     #-2,@RSWC       ;LOAD WC
3355  020254  012777  000461  160622            MOV     #461,@RSCS1     ;SET BIT A16 AND WRITE
3356  020262  105777  160616                    TSTB    @RSCS1          ;WAIT FOR READY
3357  020266  100375                            BPL     .-4
3358  020270  005777  160610                    TST     @RSCS1          ;ANY ERRORS?
3359  020274  100001                            BPL     4$              ;BRANCH IF NO
3360  020276  104002                            HLT     !ER             ;ERROR AFTER READING 2 WORDS
3361  020300  022777  005260  160576  4$:       CMP     #5260,@RSCS1    ;IS CS1 CORRECT?
3362  020306  001401                            BEQ     10$             ;BRANCH IF YES
3363  020310  104002                            HLT     !ER             ;NO CS1 DID NOT COMPARE
3364                                                                    ;READ STARTING AT 377777
3365  020312  005012                    10$:    CLR     (R2)            ;CLEAR LOCATION 400000
3366                                                                    ;READ TWO WORDS STARTING AT 377777
3367  020314  012777  177776  160566            MOV     #-2,@RSWC       ;SETUP WC
3368  020322  005077  160566                    CLR     @RSDA           ;SETUP DA
3369  020326  012777  177777  160556            MOV     #177777,@RSBA
3370  020334  012777  000471  160542            MOV     #471,@RSCS1     ;CLEAR A 17 SET A16,READ
3371  020342  105777  160536                    TSTB    @RSCS1          ;WAIT FOR READY
3372  020346  100375                            BPL     .-4
3373  020350  005777  160530                    TST     @RSCS1          ;ANY ERRORS?
3374  020354  100002                            BPL     11$             ;BRANCH IF NO
3375  020356  104002                            HLT     !ER             ;ERROR WHILE READING TWO WORDS
3376  020360  000414                            BR      EXTRP
3377  020362  022777  005270  160514  11$:      CMP     #5270,@RSCS1    ;IS CS1 CORRECT?
3378  020370  001401                            BEQ     12$             ;BRANCH IF YES
3379  020372  104002                            HLT     !ER             ;CS1 DID NOT COMPARE
3380                                                                    ;READ STARTING AT 377777
3381  020374  022712  177777          12$:      CMP     #177777,(R2)    ;WAS DATA READ INTO LOCATION 400000
3382  020400  001404                            BEQ     EXTRP           ;CORRECTLY? - BRANCH IF YES
3383  020402  012701  177777                    MOV     #177777,GOOD
3384  020406  011200                            MOV     (R2),BAD
3385  020410  104000                            HLT
3386                                                                    ;DATA COMPARE ERROR AT 400000 IF
                                                                        ;RECEIVED=0 - LOCATION WASN'T ACCESSED
3387  020412  005037  177572          EXTRP:    CLR     @#SR0           ;TURN OFF MEMORY MANAGEMENT
3388  020416  000401                            BR      EXT1
3389  020420  000240                  EXTTRP:   NOP                     ;UPDATE TEST NUMBERS
3390  020422  012706  000500          EXT1:     MOV     #500,SP         ;RESTORE STACK
3391  020426  012737  000006  000004  MEMOUT:   MOV     #6,4
3392  020434  005037  000006                    CLR     6
```

```
                                ;*****************************************************************************
                                ;TEST 115                TEST PROGRAM INTERRUPT BY MOVING 300 INTO RSCS1
                                ;*****************************************************************************
020440  104400                  TST115: SCOPE

020442  104414                  QES:    CLRDK                   ;CLEAR ALL DRIVES
020444  012706  000500                  MOV     #500,SP         ;SETUP STACK
020450  012777  020522  160456          MOV     #PGTRAP,@RSVEC  ;SET UP VECTOR
020456  012777  000340  160452          MOV     #340,@RSVCPS    ;SET TRAP PS
020464  012737  000200  177776          MOV     #200,@#PS       ;SET PS AT PRIORITY 4
020472  012777  000300  160404          MOV     #300,@RSCS1     ;THIS SHOULD CAUSE A TRAP
020500  012737  000500  001174          MOV     #500,WORK       ;SETUP LOOP
020506  005337  001174          1$:     DEC     WORK            ;DEC LOOP SHOULD
020512  001375                          BNE     1$              ;INTERRUPE BEFORE LOOP IS DONE
020514  104001                          HLT     !CS1            ;SHOULD NEVER GET HERE
020516  000137  020536                  JMP     QESDON          ;GET OUT

020522  022626                  PGTRAP: CMP     (6)+,(6)+       ;TRAP OK
020524  022777  004200  160352          CMP     #4200,@RSCS1    ;DID IE CLEAR?
020532  001401                          BEQ     .+4             ;YES
020534  104001                          HLT     !CS1            ;IE SHOULD BE CLEARED
020536                          QESDON:

                                ;*****************************************************************************
                                ;TEST 116                TEST THAT DISK DOES NOT INTERRUPT WHEN PS IS AT 5
                                ;*****************************************************************************
020536  104400                  TST116: SCOPE

020540  012706  000500          INTR5:  MOV     #500,SP         ;SETUP STACK
020544  013737  001164  022414          MOV     TIMSV,TIMES     ;RESTORE LOOP COUNTER
020552  104414                          CLRDK                   ;CLEAR ALL RS REG
020554  012777  020634  160352          MOV     #INT112,@RSVEC  ;SET UP INTERRUPT VECTOR
020562  012777  000340  160346          MOV     #340,@RSVCPS    ;SET PRIO.
020570  012737  000240  177776          MOV     #240,@#PS       ;LOCK OUT ALL INTERRUPTS ABOVE
020576  013700  177776                  MOV     @#PS,BAD        ;GET PS
020602  012777  177777  160300          MOV     #177777,@RSWC   ;SET WORD COUNT TO -1
020610  013777  001102  160274          MOV     @#OBUFSV,@RSBA  ;LOAD CURRENT ADDRESS
020616  012777  000161  160260          MOV     #161,@RSCS1     ;GO WRITE (INTERRUPT ENABLED)
020624  004737  026600                  JSR     PC,WAITRY       ;WAIT FOR READY
020630  104001                          HLT     !CS1            ;NO RDY NEVER CAME UP
020632  000403                          BR      INTDON          ;RESTART ROUTINE
                                ;PROCESSOR SHOULD NOT TRAP TO INT112

020634  012701  000240          INT112: MOV     #240,GOOD       ;WHAT PS SHOULD HAVE
020640  104000                          HLT                     ;GOOD = CORRECT ANS FOR PS
020642                          INTDON:                         ;DONE GET OUT
```

```
3439                                    ;*****************************************************************************
3440                                    ;TEST 117                   TEST THAT DISK DOES INTERRUPT WHEN PS IS AT 4
3441                                    ;*****************************************************************************
3442  020642  104400                    TST117: SCOPE
3443
3444  020644  012706  000500            INTR4:  MOV     #500,SP             ;SETUP STACK
3445  020650  104414                            CLRDK                       ;CLEAR ALL RS REG
3446  020652  012777  020746  160254            MOV     #INT114,@RSVEC      ;SET UP DISK TRAP VECTOR
3447  020660  012777  000340  160250            MOV     #340,@RSVCPS        ;SET PRIO.
3448  020666  012737  000200  177776            MOV     #200,@#PS           ;SET PROCESSOR TO PRIORITY 4
3449  020674  013700  177776                    MOV     @#PS,BAD            ;GET PS
3450  020700  012701  000200                    MOV     #200,GOOD           ;GET CORRECT PS
3451  020704  012777  177777  160176            MOV     #177777,@RSWC       ;SET WORD COUNT TO -1
3452  020712  013777  001102  160172            MOV     @#OBUFSV,@RSBA      ;LOAD CURRENT ADDRESS
3453  020720  012777  000161  160156            MOV     #161,@RSCS1         ;WRITE (INTERRUPT ENABLE
3454  020726  005037  001174                    CLR     WORK
3455  020732  005237  001174                    INC     WORK                ;WAIT FOR INTERRUPT TO OCCUR
3456  020736  001375                            BNE     .-4
3457  020740  104000                            HLT                         ;GOOD=CORRECT PS BAD=WRONG PS
3458  020742  104042                            HLT     !ER!DS
3459  020744  000405                            BR      DONINT              ;CONT
3460  020746  022777  004260  160130  INT114:  CMP     #4260,@RSCS1        ;DID IE CLEAR?
3461  020754  001401                            BEQ     .+4                 ;YES
3462  020756  104001                            HLT     !CS1                ;WHY DID NOT IE CLEAR
3463  020760                            DONINT:
3464
3465                                    ;*****************************************************************************
3466                                    ;TEST 120                   TEST INTERRUPT ON ERROR
3467                                    ;*****************************************************************************
3468  020760  104400                    TST120: SCOPE
3469
3470  020762  012706  000500            ERINT:  MOV     #500,SP             ;SETUP STACK
3471  020766  012737  000200  177776            MOV     #200,@#PS           ;SET PS AT PRI 4
3472  020774  012777  021052  160132            MOV     #ERRINT,@RSVEC      ;SET UPINTERRUPT ADD.
3473  021002  104414                            CLROK                       ;CLEAR ALL RS REG
3474  021004  012777  000340  160124            MOV     #340,@RSVCPS        ;SET PRIO.
3475  021012  012777  177777  160074            MOV     #177777,@RSDA       ;SET RSDA=TO ALL ONES
3476  021020  012777  177600  160062            MOV     #177600,@RSWC       ;WORD COUNT=-200
3477  021026  013777  001102  160056            MOV     @#OBUFSV,@RSBA      ;CURRENT ADDRESS=OUTBUF
3478  021034  012777  000161  160042            MOV     #161,@RSCS1         ;WRITE
3479  021042  004737  026600                    JSR     PC,WAITRY           ;WAIT FOR READY
3480  021046  104042                    1$:     HLT     !ER!DS              ;Y DIDN'T PGM INTERRUPT IS RDY SET?
3481  021050  000406                            BR      FINTST              ;GET OUT
3482  021052  022777  144260  160024  ERRINT:  CMP     #144260,@RSCS1      ;IS CS1 RIGHT?
3483  021060  001401                            BEQ     .+4                 ;YES
3484  021062  104042                            HLT     !ER!DS
3485  021064  022626                            CMP     (6)+,(6)+           ;CLEAR STACK
3486  021066                            FINTST:
```

```
3487                                    ;*****************************************************************************
3488                                    ;TEST 121                   DYNAMIC FUNCTION TEST
3489                                    ;*****************************************************************************
3490  021066  104400                    TST121: SCOPE
3491                                    ;EXECUTE FUNCTION MODIFY UNIT # AND DO A DRIVE SEARCH
3492                                    ;DRIVE SEARCH WILL ONLY BE DONE IF THERE ARE AT LEAST 2 DRIVES
3493                                    ;2ND DRIVE MAY NOT BE TESTED YET SO IF THIS TEST FAILS CHECK 2ND DRIVE
3494                                    ;BEFORE TRYING TO DEBUG THIS TEST
3495
3496  021070  104414                    MODNUM: CLRDK                           ;CLEAR ALL RS REG
3497  021072  013737  022414  001164            MOV     TIMES,TIMSV             ;SAVE LOOP COUNT
3498  021100  012737  000010  022414            MOV     #10,TIMES               ;LOOP ONLY 10 TIMES
3499  021106  005037  001176                    CLR     WORK1                   ;CLEAR WORK LOC.
3500  021112  005003                            CLR     R3
3501  021114  005004                            CLR     R4
3502  021116  012702  022044                    MOV     #DVTAB,R2               ;SETUP TABLE
3503  021122  012737  000401  001174            MOV     #401,WORK               ;SETUP TO TEST FOR MORE DRIVES
3504  021130  033737  001174  001154  7$:       BIT     WORK,UNITSV             ;IS DRIVE ON SYSTEM?
3505  021136  001403                            BEQ     6$                      ;NO
3506  021140  020437  001152                    CMP     R4,UNNUM                ;IS THIS THE SAME DRIVE?
3507  021144  001017                            BNE     8$                      ;NO
3508  021146  005204                    6$:     INC     R4                      ;UPDATE 2ND UNIT #
3509  021150  000241                            CLC
3510  021152  006137  001174                    ROL     WORK                    ;CHECK FOR NEXT DRIVE
3511  021156  103364                            BCC     7$                      ;NOT DONE YET
3512  021160  032737  000010  001176            BIT     #BIT3,WORK1             ;MULTI DRIVE?
3513  021166  001016                            BNE     12$                     ;YES
3514  021170  013705  001152                    MOV     UNNUM,R5                ;LOAD UNIT NO
3515  021174  005205                            INC     R5                      ;CHANGE IT
3516  021176  042705  177770                    BIC     #177770,R5              ;CLEAR JUNK
3517  021202  000410                            BR      12$
3518  021204  052737  000010  001176  8$:       BIS     #BIT3,WORK1             ;SET FOUND MULTI DRIVE
3519  021212  010422                            MOV     R4,(R2)+                ;LOAD UNT # INTO TABLE
3520  021214  005203                            INC     R3                      ;COUNT # OF DRIVES
3521  021216  010337  001172                    MOV     R3,SAVEE                ;SAVE IT
3522  021222  000751                            BR      6$
3523  021224  012777  021340  157702  12$:      MOV     #TSTVEC,@RSVEC          ;SETUP INT. TRAP
3524  021232  012777  000340  157676            MOV     #340,@RSVCPS            ;SETUP PRIO.
3525  021240  005037  027364                    CLR     OUTBUF                  ;CLR TO READ INTO
3526  021244  013777  001102  157640            MOV     @#OBUFSV,@RSBA          ;SET UP CURRENT ADDRESS
3527  021252  012777  177000  157630            MOV     #-1000,@RSWC            ;SET WORD COUNT
3528  021260  012777  000060  157626  1$:       MOV     #60,@RSDA               ;LOAD DA
3529  021266  012702  022044                    MOV     #DVTAB,R2               ;GET TABLE
3530  021272  012777  000161  157604            MOV     #161,@RSCS1             ;GO WRITE
3531  021300  005703                            TST     R3                      ;MORE THEN 1 DRIVE?
3532  021302  001003                            BNE     13$                     ;YES
3533  021304  010577  157576                    MOV     R5,@RSCS2               ;NO MODIFY UNIT #
3534  021310  000407                            BR      14$
```

```
3535  021312  012277  157570          13$:    MOV     (R2)+,@RSCS2    ;LOAD UNIT#
3536  021316  012777  000131  157560          MOV     #131,@RSCS1     ;DO SEARCH
3537  021324  005303                          DEC     R3              ;DONE ALL DRIVES YET?
3538  021326  001371                          BNE     13$             ;NO
3539  021330  012737  000200  177776  14$:    MOV     #200,@#PS       ;ENABLE INTERRUPTS
3540  021336  000001                  WTDV:   WAIT
3541  021340  013777  001152  157540  TSTVEC: MOV     UNNUM,@RSCS2    ;GET 1ST DRIVE
3542  021346  017700  157532                  MOV     @RSCS1,BAD      ;GET CS1
3543  021352  042700  100000                  BIC     #BIT15,BAD      ;CLEAR SC
3544  021356  012701  004260                  MOV     #4260,GOOD      ;GET CORRECT ANS
3545  021362  020100                          CMP     GOOD,BAD        ;IS CS1 CORRECT?
3546  021364  001402                          BEQ     4$              ;NO! X-FER OK
3547  021366  104000                          HLT                     ;CS1 SHOULD = 14270 OR 4270
3548  021370  104140                          HLT     !DS!AS
3549  021372  005777  157512          4$:     TST     @RSWC           ;TEST WC
3550  021376  001401                          BEQ     .+4             ;WORD COUNT DID OVERFLOW
3551  021400  104010                          HLT     !WC             ;SHOULD = 0
3552  021402  013701  001152                  MOV     UNNUM,GOOD      ;GET CORRECT
3553  021406  052701  000100                  BIS     #100,GOOD       ;ANS OF CS2
3554  021412  017700  157470                  MOV     @RSCS2,BAD      ;GET CS2
3555  021416  020100                          CMP     GOOD,BAD        ;IS CS2 CORRECT?
3556  021420  001401                          BEQ     .+4             ;YES
3557  021422  104000                          HLT                     ;GOOD = CORRECT ANS FOR CS2
3558  021424  017700  157462                  MOV     @RSBA,BAD       ;FETCH CURRENT ADDRESS
3559  021430  013701  001102                  MOV     @#OBUFSV,GOOD   ;WHAT RSBA SHOULD EQUAL
3560  021434  062701  002000                  ADD     #2000,GOOD      ;UPDATE IT
3561  021440  020001                          CMP     BAD,GOOD        ;IS RSBA CORRECT
3562  021442  001401                          BEQ     .+4             ;YES EXECUTE CONTINUE
3563  021444  104000                          HLT                     ;RSBA FAILED TO INCREMENT
3564  021446  022737  000004  001162          CMP     #4,RS04DT       ;RS03LA?
3565  021454  001006                          BNE     2$              ;NO
3566  021456  022777  000100  157430          CMP     #100,@RSDA      ;IS DA CORRECT?
3567  021464  001420                          BEQ     3$              ;OK
3568  021466  104104                          HLT     !DA!AS
3569  021470  000416                          BR      3$              ;CONTINUE
3570  021472  005737  001162          2$:     TST     RS04DT          ;IS THIS A RS04?
3571  021476  001006                          BNE     5$              ;YES
3572  021500  022777  000070  157406          CMP     #70,@RSDA       ;IS DA CORRECT?
3573  021506  001407                          BEQ     3$              ;YES
3574  021510  104104                          HLT     !DA!AS          ;DA NOT CORRECT
3575  021512  000405                          BR      3$              ;CONTINUE
3576  021514  022777  000064  157372  5$:     CMP     #64,@RSDA       ;WAS RSDA INCREMENTED
3577  021522  001401                          BEQ     .+4             ;RSDA OK
3578  021524  104046                          HLT     !DA!ER!DS       ;RSDA SHOULD CONTAIN A 64
3579  021526  012777  040000  157350  3$:     MOV     #TRE,@RSCS1     ;CLEAR ALL ERRORS IF ANY
3580  021534  032737  000010  001176          BIT     #BIT3,WORK1     ;MULTI DRIVE?
3581  021542  001461                          BEQ     WTDV1           ;NO
3582  021544  012777  021570  157362  1$:     MOV     #TTVEC,@RSVEC   ;SETUP INT FOR NEXT DRIVE
3583  021552  012716  021566                  MOV     #WTDV2,(SP)     ;GET WAIT
3584  021556  012777  000100  157320          MOV     #100,@RSCS1     ;SET IE
3585  021564  000002                          RTI                     ;RETURN
3586  021566  000001                  WTDV2:  WAIT
```

```
                                        ;SERVICE ROUTINE FOR SEARCH FUNCTIONS
021570  005002                  TTVEC:  CLR     R2              ;CLEAR UNIT #
021572  000241                          CLC
021574  012737  000401  001174          MOV     #401,WORK
021602  033777  001174  157312  1$:     BIT     WORK,@RSAS      ;DID THIS DRIVE INT?
021610  001006                          BNE     2$              ;YES
021612  005202                          INC     R2              ;UPDATE UNIT #
021614  000241                          CLC
021616  006137  001174                  ROL     WORK
021622  103367                          BCC     1$
021624  104100                          HLT     !AS             ;WHY DID WE INT WITH NO ATA???
021626  010277  157254          2$:     MOV     R2,@RSCS2       ;GET DRIVE
021632  022777  110600  157256          CMP     #110600,@RSDS   ;DID PIP CLEAR?
021640  001401                          BEQ     .+4             ;YES
021642  104140                          HLT     !DS!AS          ;PIP BIT DID NOT CLEAR
021644  022777  104230  157232          CMP     #104230,@RSCS1  ;DID SC SET?
021652  001401                          BEQ     .+4             ;YES
021654  104140                          HLT     !AS!DS          ;SC DID NOT SET
021656  005337  001172                  DEC     SAVEE           ;COUNT # OF INT
021662  001411                          BEQ     WTDV1           ;DONE YET?
021664  013777  001174  157230          MOV     WORK,@RSAS      ;CLEAR AS
021672  012777  000100  157204          MOV     #100,@RSCS1     ;SET IE
021700  012716  021566                  MOV     #WTDV2,(SP)     ;RETURN TO WAIT
021704  000002                          RTI
021706  012737  000340  177776  WTDV1:  MOV     #340,@#PS
021714  012706  000500                  MOV     #500,SP         ;CLEAR STACK
021720  013777  001136  157206          MOV     RSVCPS,@RSVEC   ;RESTORE INT VECTOR
021726  005077  157204                  CLR     @RSVCPS
021732  104400                  MODDON: SCOPE                   ;DONE
021734  013737  001164  022414          MOV     TIMSV,TIMES     ;RESTORE LOOP COUNT
021742  012737  000340  177776          MOV     #340,@#PS       ;RESTORE PS
021750  012737  000001  001000          MOV     #1,ICNT         ;FUGE TEST NUMBERS
021756  000137  001634          OUT:    JMP     @#TRYNX         ;TEST NEXT DRIVE
                                .SBTTL          $DONE - BELL AND SCOPE ROUTINE

021762  104400                  DONE:   SCOPE                   ;TERMINATIONG SCOPE FOR LOOPING
021764  062737  000001  001006          ADD     #1,PCNT+2       ;ADD 1 TO THE PASS COUNT
021772  005537  001004                  ADC     PCNT            ;MAKE IT DOUBLE PREC.
021776  032777  002000  157022          BIT     #SW10,@SWR      ;RING THE BELL?
022004  001004                          BNE     4$              ;NO!
022006  104402  022012                  TYPE    .+2             ;.ASCIZ <BELL><177>
022016  013700  000042          4$:     MOV     @#42,R0         ;GET MONITOR ADDRESS
022022  001405                          BEQ     $END1           ;IF NONE
022024  000005                          RESET
022026  004710                  $ENDAD: JSR     7,(0)           ;GO TO MONITOR
022030  000240  000240  000240          240,240,240             ;SAVE ROOM FOR ACT11
022036  000137  001202          $END1:  JMP     @#BEGIN         ;RETURN

022042  000000                  .TBIT:  0                       ;T BIT FLAG

022044  000010                  DVTAB:  .BLKW   10
```

```
3638                                    .SBTTL          $TYPE - TTY TYPEOUT ROUTINE
3639
3640                                    ;THIS ROUTINE IS USE TO TYPE ASCII MESSAGES ON THE TTY. THE
3641                                    ;CALL CAN BE IN ONE OF 3 FORMS: 1) "TYPE ,ADR" - TYPES THE
3642                                    ;MESSAGE STARTING IN LOCATION "ADR:", 2) "TYPE ,CHAR" - TYPES
3643                                    ;THE ASCII "CHAR", AND 3) "PRINT <<15><12>"MESSAGE"> - TYPES
3644                                    ;THE MESSAGE WHICH IS INLINE ASCII. THE FILLER CHARACTER WHICH IS
3645                                    ;TYPED AFTER A LINE FEED IS IN FILCHR AND THE NUMBER OF FILLERS
3646                                    ;IS IN FILCHR+1.
3647
3648  022064  010446                .TYPE:  MOV     R4,-(6)         ;SAVE R4
3649  022066  010546                        MOV     R5,-(6)         ;SAVE R5
3650  022070  017605  000004               MOV     @4(6),R5        ;GET ADDRESS TO BE TYPED
3651  022074  032705  177400               BIT     #177400,R5      ;IS IT A TYPEM?
3652  022100  001002                       BNE     1$              ;NO
3653  022102  016605  000004               MOV     4(6),R5         ;GET ADDRESS OF CHARACTER
3654  022106  105715                1$:     TSTB    (R5)            ;TERMINATOR?
3655  022110  001423                       BEQ     2$              ;GET OUT IF SO
3656  022112  122715  000012               CMPB    #12,(R5)        ;IS THE CHAR A LINE FEED
3657  022116  001012                       BNE     4$              ;NO - GET OUT
3658  022120  113704  001015               MOVB    FILCHR+1,R4     ;GET THE FILL COUNT
3659  022124  113777  001014  156672 5$:    MOVB    FILCHR,@#TPB    ;TYPE A FILLER
3660  022132  105777  156660               TSTB    @#TPS           ;DONE YET?
3661  022136  100375                       BPL     .-4             ;NO - WAIT
3662  022140  005304                       DEC     R4              ;DEC COUNT
3663  022142  001370                       BNE     5$              ;LOOP UNTIL 0
3664  022144  112577  156654        4$:    MOVB    (R5)+,@#TPB     ;LOAD AND TYPE THE CHARACTER
3665  022150  105777  156642               TSTB    @#TPS           ;IS THE PRINTER READY
3666  022154  100375                       BPL     .-4             ;WAIT UNTIL IT IS
3667  022156  000753                       BR      1$              ;GET THE NEXT CHARACTER
3668  022160  017646  000004        2$:    MOV     @4(6),-(6)      ;GET ADDRESS TO BE TYPED
3669  022164  062766  000002  000006       ADD     #2,6(6)         ;ADD 2 TO THE ADDRESS
3670  022172  022666  000004               CMP     (6)+,4(6)       ;IS IT .+2?
3671  022176  001006                       BNE     3$              ;NO
3672  022200  062705  000002               ADD     #2,R5           ;ADD 2 TO THE ADDRESS
3673  022204  042705  000001               BIC     #1,R5           ;BACK UP TO AN EVEN BYTE
3674  022210  010566  000004               MOV     R5,4(6)         ;RESTORE ADDRESS
3675  022214  012605                3$:    MOV     (6)+,R5         ;RESTORE R5
3676  022216  012604                       MOV     (6)+,R4         ;RESTORE R4
3677  022220  000002                       RTI                     ;RETURN
```

```
                                        .SBTTL          $SCOPE - SCOPE LOOP HANDLER

                                        ;THIS ROUTINE HANDLES THE ITERATIONS, LOOPING, ERROR
                                        ;LOOPING, AND THE DISPLAYING OF THE TEST NUMBER.
                                        ;"SCOPE" IS PLACED BETWEEN EACH SUBTEST IN THE TEST AND
                                        ;RECORDS THE STARTING ADDRESS OF THE SUBTEST IN "LAD:"

022222  104416                  .SCOPE: KBDIN                   ;GO CHECK FOR ↑G
022224  032777  000400  156574          BIT     #SW8,@SWR       ;LOOP ON SPEC. TEST?
022232  001404                          BEQ     1$              ;NO LOOP ON SPEC. TEST
022234  127737  156566  001000          CMPB    @SWR,ICNT       ;ON RIGHT TEST?   *SW7-0*
022242  001453                          BEQ     .OVER           ;NOT RIGHT TEST
022244  032777  040000  156554  1$:     BIT     #SW14,@SWR      ;LOOP ON TEST?
022252  001045                          BNE     .KIT            ;LOOP ON TEST IS SET
022254  000416                          BR      3$              ;SKIP - NOP FOR XOR TESTER
022256  013746  000004                  MOV     @#4,-(6)        ;PUSH @#4 ON STACK
022262  012737  022302  000004          MOV     #4$,@#4         ;SET FOR TIMEOUT
022270  005737  177060                  TST     @#177060        ;ERROR ON XOR?
022274  012637  000004                  MOV     (6)+,@#4        ;POP STACK INTO @#4
022300  000422                          BR      .SVLAD          ;NO ERROR - GO TO NEXT TEST
022302  022626                  4$:     CMP     (6)+,(6)+       ;CLEAR STACK
022304  012637  000004                  MOV     (6)+,@#4        ;POP STACK INTO @#4
022310  000426                          BR      .KIT            ;ERROR - LOOP ON TEST
022312  032777  004000  156506  3$:     BIT     #SW11,@SWR      ;KILL ITERATIONS
022320  001012                          BNE     .SVLAD          ;YES - KILL ITERATIONS
022322  105737  001001                  TSTB    ICNT+1          ;FIRST ONE?
022326  001404                          BEQ     2$              ;BRANCH IF FIRST
022330  123737  022414  001001          CMPB    TIMES,ICNT+1    ;DONE?
022336  003013                          BGT     .KIT            ;BRANCH IF NOT
022340  112737  000001  001001  2$:     MOVB    #1,ICNT+1       ;FIRST ITERATION
022346  105237  001000          .SVLAD: INCB    ICNT            ;COUNT TEST NUMBERS
022352  011637  001010                  MOV     (6),LAD         ;SAVE LOOP ADDRESS
022356  013777  001000  156444          MOV     ICNT,@DISPLAY   ;DISPLAY TEST NO. AND ITERATION COUNT
022364  000002                          RTI                     ;RETURN

022366  105237  001001          .KIT:   INCB    ICNT+1          ;INC THE ITERATION COUNT
022372  013777  001000  156430  .OVER:  MOV     ICNT,@DISPLAY   ;SET UP DISPLAY
022400  005737  001010                  TST     LAD             ;FIRST ONE?
022404  001760                          BEQ     .SVLAD          ;YES
022406  013716  001010                  MOV     LAD,(6)         ;FUDGE RETURN ADDRESS
022412  000002                          RTI                     ;FIXES PS

022414  000100                  TIMES:  100                     ;RUN 100 TIMES
```

```
3721                                    .SBTTL          $HLT - HLT ROUTINE (ERROR TYPEOUT)
3722
3723                                    ;THIS ROUTINE PRINTS OUT ERROR MESSAGES STARTING WITH THE
3724                                    ;ADDRESS OF THE "HLT". IT ALSO COUNTS THE NUMBER OF ERRORS
3725                                    ;AND HAS THE CAPABILITY OF LOOPING ON ERROR, BELL ON ERROR,
3726                                    ;"HALT" ON ERROR, AND INHIBIT TYPEOUTS. AN OPTIONAL ARGUMENT
3727                                    ;(HLT+3) WILL BE PLACED IN ".HLTCT:" FOR ADITIONAL TYPEOUTS.
3728
3729  022416  104416                  .HLT:   KBDIN                   ;GO CHECK FOR ↑G
3730  022420  032777  002000  156400          BIT     #SW10,@SWR      ;BELL ON ERROR?
3731  022426  001402                          BEQ     1$              ;NO - SKIP
3732  022430  104402  000007                  TYPE    ,BELL           ;RING BELL
3733  022434  005237  001002          1$:     INC     ERRORS          ;COUNT THE NUMBER OF ERRORS
3734  022440  032777  020000  156360          BIT     #SW13,@SWR      ;SKIP TYPEOUT IF SET
3735  022446  001025                          BNE     2$              ;SKIP TYPEOUTS
3736  022450  104402  022454                  TYPE    .+2             ;.ASCIZ <15><12>
3737  022460  011637  001012                  MOV     (6),HLTADR      ;PUT ADDRESS OF INSTRUCTION ON STACK
3738  022464  162737  000002  001012          SUB     #2,HLTADR       ;FUDGE ADDRESS
3739  022472  117737  156314  022554          MOVB    @HLTADR,.HLTCT  ;GET HLT ARGUEMENT
3740  022500  013746  001012                  MOV     HLTADR,-(6)     ;PUT HLTADR ON STACK
3741  022504  104404                          TYPEO                   ;TYPE STACK IN OCTAL
3742  022506  104402  022512                  TYPE    .+2             ;.ASCIZ " "
3743  022516  004737  026066                  JSR     PC,RSREG        ;GO TO USER ERROR ROUTINE
3744  022522  005777  156300          2$:     TST     @SWR            ;HALT ON ERROR
3745  022526  100001                          BPL     .+4             ;SKIP IF CONTINUE
3746  022530  000000                          HALT                    ;HALT ON ERROR!
3747  022532  032777  001000  156266          BIT     #SW9,@SWR       ;CHECK FOR INHIBIT LOOP ON ERROR
3748  022540  001003                          BNE     3$              ;SKIP IF LOOP ON ERROR
3749  022542  105037  001001                  CLRB    ICNT+1          ;CLEAR ITERATION COUNT
3750  022546  000002                          RTI                     ;RETURN
3751  022550  000137  022366          3$:     JMP     .KIT            ;LOOP ON TEST UNTIL NO ERRORS
3752
3753  022554  000000                  .HLTCT: 0                       ;HLT ARGUMENT
```

```
                                        .SBTTL          $OCTAL - OCTAL TYPEOUT ROUTINE

                                        ;THIS ROUTINE IS USED TO TYPE AN OCTAL NUMBER ON THE TTY. IT WILL TYPE
                                        ;ALL 6 CHARACTERS, SUPPRESS LEADING ZEROES, OR TYPE THE
                                        ;16 BITS. IT IS CALLED VIA THE TYPOCT, TYPBIT, OR TYPOCS MACRO'S.

022556  012737  170101  022744  .TYPEB: MOV     #170101,.PR     ;SET BIT FLAG AND 16. CHARACTER COUNT
022564  000411                  BR      .PTIT           ;NOW TYPE IT IN BIT FORM
022566  112737  000001  022744  .TYPEO: MOVB    #1,.PR          ;SET ZERO FILL SWITCH
022574  000402                  BR      .+6             ;SKIP
022576  005037  022744          .TYPES: CLR     .PR             ;SUPRESS LEADING ZERO'S
022602  112737  177772  022745          MOVB    #-6,.PR+1       ;SET COUNT
022610                          .PTIT:
022610  010446                  MOV     R4,-(6)         ;PUSH R4 ON STACK
022612  010546                  MOV     R5,-(6)         ;PUSH R5 ON STACK
022614  016605  000010          MOV     10(6),R5        ;GET THE DATA
022620  012704  022746          MOV     #.PR+2,R4       ;SET POINTER TO FIRST ASCII CHAR.
022624  105014                  CLRB    (4)             ;CLEAR FIRST BYTE
022626  000411                  BR      .PRF            ;ROTATE FIRST BIT
022630  105014                  .PRL:   CLRB    (4)             ;CLEAR BYTE OF CHARACTER
022632  032737  000100  022744          BIT     #100,.PR        ;BIT TYPING MODE?
022640  001004                  BNE     .PRF            ;YES - SKIP 2 ROTATES
022642  006105                  ROL     R5              ;ROTATE BIT INTO C
022644  106114                  ROLB    (4)             ;PACK IT
022646  006105                  ROL     R5              ;ROTATE BIT INTO C
022650  106114                  ROLB    (4)             ;PACK IT
022652  006105                  .PRF:   ROL     R5              ;ROTATE BIT INTO C
022654  106114                  ROLB    (4)             ;PACK IT
022656  105714                  TSTB    (4)             ;IS IT ZERO?
022660  001402                  BEQ     .+6             ;SKIP INC
022662  105237  022744          INCB    .PR             ;SET FILL SWITCH
022666  105737  022744          TSTB    .PR             ;CHECK FILL SWITCH
022672  001402                  BEQ     .+6             ;SKIP BITSET
022674  152724  000060          BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
022700  105237  022745          INCB    .PR+1           ;INC COUNT
022704  001351                  BNE     .PRL            ;REPEAT
022706  022704  022746          CMP     #.PR+2,R4       ;EMPTY BUFFER?
022712  001002                  BNE     .+6             ;SKIP IF NOT
022714  112724  000060          MOVB    #'0,(4)+        ;LOAD 1 ZERO
022720  105014                  CLRB    (4)             ;NULL TERMINATOR
022722  104402  022746          TYPE    .PR+2           ;TYPE IT
022726  012605                  MOV     (6)+,R5         ;POP STACK INTO R5
022730  012604                  MOV     (6)+,R4         ;POP STACK INTO R4
022732  016666  000002  000004  MOV     2(6),4(6)       ;GET RID OF
022740  012616                  MOV     (6)+,(6)        ;DATA WORD
022742  000002                  RTI                     ;RETURN

022744  000012          .PR:    .BLKW   12              ;COUNT, SWITCH, AND OUTPUT BUFFER
```

```
                                        .SBTTL          $POWER - POWER DOWN AND UP ROUTINES

                                        ;THIS IS THE POWER FAIL ROUTINE WHICH WILL SAVE ALL
                                        ;THE GENERAL REGISTERS AND USER DEFINED REGISTERS THEN
                                        ;WAIT FOR POWER TO GO DOWN AND BE RESTORED.
                                        ;IF THERE ISN'T ENOUGH TIME FOR SAVING ALL THE REGISTERS,
                                        ;THE PROGRAM WILL HALT AT '.ILLUP'.

022770  012777  023114  000124  .POWER:  MOV     #.ILLUP,@.PUVEC ;SET FOR FAST UP
022776  012777  000340  000120           MOV     #340,@.PUVEC$+2 ;PRIO:7
023004  010046                           MOV     R0,-(6)         ;PUSH R0 ON STACK
023006  010146                           MOV     R1,-(6)         ;PUSH R1 ON STACK
023010  010246                           MOV     R2,-(6)         ;PUSH R2 ON STACK
023012  010346                           MOV     R3,-(6)         ;PUSH R3 ON STACK
023014  010446                           MOV     R4,-(6)         ;PUSH R4 ON STACK
023016  010546                           MOV     R5,-(6)         ;PUSH R5 ON STACK
023020  010637  023120                   MOV     SP,.SAVR6       ;SAVE SP
023024  012777  023034  000070           MOV     #.POWUP,@.PUVEC ;SET UP VECTOR
023032  000000                           HALT                    ;WAIT FOR PF

023034  013706  023120           .POWUP: MOV     .SAVR6,SP       ;GET SP
023040  005001                           CLR     R1              ;WAIT LOOP FOR THE TTY
023042  005201                   1$:     INC     R1              ;WAIT FOR THE INC
023044  001376                           BNE     1$              ;OF  WORD
023046  012605                           MOV     (6)+,R5         ;POP STACK INTO R5
023050  012604                           MOV     (6)+,R4         ;POP STACK INTO R4
023052  012603                           MOV     (6)+,R3         ;POP STACK INTO R3
023054  012602                           MOV     (6)+,R2         ;POP STACK INTO R2
023056  012601                           MOV     (6)+,R1         ;POP STACK INTO R1
023060  012600                           MOV     (6)+,R0         ;POP STACK INTO R0
023062  012737  022770  000024           MOV     #.POWER,@#24    ;SET UP THE POWER DOWN VECTOR
023070  012737  000340  000026           MOV     #340,@#26       ;PRIO:7
023076  104402  023102                   TYPE    ,.+2            ;.ASCIZ <15><12>"POWER"
023112  000002                           RTI                     ;RETURN

023114  000000           .ILLUP: HALT                    ;THE POWER UP SEQUENCE WAS STARTED
023116  000776                   BR      .-2             ; BEFORE THE POWER DOWN WAS COMPLETE

023120  000000           .SAVR6: 0                       ;PUT THE SP HERE
023122  000024  000026   .PUVEC: 24,26                   ;POWER UP VECTOR
```

```
3842                                    .SBTTL          $RDOCT - OCTAL INPUT ROUTINE
3843
3844                                    ;THIS ROUTINE CALLS RDLIN, INPUTS A LINE FROM THE TTY AND CONVERTS
3845                                    ;IT INTO AN OCTAL NUMBER WHICH IS THE FIRST WORD ON THE STACK.
3846
3847  023126  011646                    .RDOCT: MOV     (6),-(6)        ;MOVE THE PC
3848  023130  016666  000004  000002            MOV     4(6),2(6)       ;MOVE THE PS
3849  023136  010146                            MOV     R1,-(6)         ;PUSH R1 ON STACK
3850  023140  010246                            MOV     R2,-(6)         ;PUSH R2 ON STACK
3851  023142  010346                            MOV     R3,-(6)         ;PUSH R3 ON STACK
3852  023144  104412                    4$:     RDLIN                   ;READ A LINE INTO INPUT
3853  023146  005001                            CLR     R1              ;INIT DATA WORD
3854  023150  005037  027276                    CLR     CTN             ;CLEAR COUNT WORD
3855  023154  012703  023402                    MOV     #INPUT,R3       ;INIT POINTER
3856  023160  112302                    1$:     MOVB    (3)+,R2         ;GET A BYTE
3857  023162  122702  000015                    CMPB    #15,R2          ;WAS IT A ,CR?
3858  023166  001421                            BEQ     2$              ;GET OUT IF YES
3859  023170  122702  000060                    CMPB    #'0,R2          ;CHECK FOR 0 OR GREATER
3860  023174  003024                            BGT     3$              ;ERROR - LESS THAN 0
3861  023176  122702  000067                    CMPB    #'7,R2          ;CHECK FOR 7 OR LESS
3862  023202  002421                            BLT     3$              ;ERROR - GREATER THAN 7
3863  023204  006002                            ROR     R2              ;GET
3864  023206  006002                            ROR     R2              ;INTO
3865  023210  006002                            ROR     R2              ;POSITION
3866  023212  006101                            ROL     R1              ;FIRST BIT
3867  023214  006102                            ROL     R2              ;GET
3868  023216  006101                            ROL     R1              ;SECOND BIT
3869  023220  006102                            ROL     R2              ;GET
3870  023222  006101                            ROL     R1              ;THIRD BIT
3871  023224  005237  027276                    INC     CTN             ;YES HE TYPED SOMETHING
3872  023230  000753                            BR      1$              ;LOOP
3873  023232  010166  000012            2$:     MOV     R1,12(6)        ;SAVE THE RESULT
3874  023236  012603                            MOV     (6)+,R3         ;POP STACK INTO R3
3875  023240  012602                            MOV     (6)+,R2         ;POP STACK INTO R2
3876  023242  012601                            MOV     (6)+,R1         ;POP STACK INTO R1
3877  023244  000002                            RTI                     ;RETURN
3878
3879  023246                            3$:
3880  023246  104402  023252                    TYPE    ,.+2            ;.ASCIZ "?"<15><12>
3881  023256  000732                            BR      4$              ;TRY AGAIN
```

```
                                        .SBTTL          $RDLIN - TTY INPUT ROUTINE

                                        ;THIS ROUTINE INPUTS A LINE TERMINATED BY A RETURN INTO ADDRESS
                                        ;INPUT AND RETURNS A LINE FEED. THE BUFFER HAS A NULL TERMINATOR
                                        ;INSTEAD OF THE RETURN. RUBOUTS ARE HANDLED BY RETYPING
                                        ;THE LINE. BUFFER OVERFLOW ERRORS LIKE A RUBOUT.

023260  010546                  .RDLIN: MOV     R5,-(6)         ;SAVE R5
023262  012705  023402          1$:     MOV     #INPUT,R5       ;GET ADDRESS
023266  022705  023422          2$:     CMP     #INPUT+16.,R5   ;BUFFER FULL?
023272  001423                          BEQ     4$              ;YES - TYPE "?"
023274  105737  177560                  TSTB    @#177560        ;WAIT FOR
023300  100375                          BPL     .-4             ;A CHARACTER
023302  113715  177562                  MOVB    @#177562,(5)    ;GET CHARACTER
023306  142715  000200                  BICB    #200,(5)        ;GET RID OF JUNK
023312  122715  000025                  CMPB    #25,(5)         ;IS IT A ^U
023316  001006                          BNE     5$              ;BRANCH IF NOT
023320  104402  023324                  TYPE    ,.+2            ;.ASCIZ "^U"<15><12>
023332  000753                          BR      1$              ;START OVER
023334  122715  000177          5$:     CMPB    #177,(5)        ;IS IT A RUBOUT
023340  001005                          BNE     3$              ;SKIP IF NOT
023342                          4$:
023342  104402  023346                  TYPE    ,.+2            ;.ASCIZ "?"<15><12>
023352  000743                          BR      1$              ;ZAP THE BUFFER AND LOOP
023354  111527  000000          3$:     MOVB    (5),#0          ;SET UP FOR TYPING
023360  104402  023356                  TYPE    ,3$+2           ;ECHO IT
023364  122725  000015                  CMPB    #15,(5)+        ;CHECK FOR RETURN
023370  001336                          BNE     2$              ;LOOP IF NOT RETURN
023372  104402  000012                  TYPE    ,12             ;TYPE A LINE FEED
023376  012605                          MOV     (6)+,R5         ;RESTORE R5
023400  000002                          RTI                     ;RETURN

023402  000020                  INPUT:  .BLKB   16.             ;TTY INPUT AREA
                                        .SBTTL          $TRAP - TRAP HANDLER

                                        ;THIS ROUTINE DECODES A TRAP CALL AND JUMPS TO THE APROPRATE
                                        ;SUBROUTINE. THE CALL IS A "TRAP+N" WHERE N IS A MULTIPLE OF 2.
                                        ;THE "SET" MACRO WILL CREATE THE TABLE NEEDED. IT HAS TO
                                        ;FOLLOW THIS MACRO.

023422  011646                  .TRAP:  MOV     (6),-(6)        ;GET ADDRESS OF TRAP +2
023424  162716  000002                  SUB     #2,(6)          ;MAKE IT ADDRESS OF TRAP
023430  017616  000000                  MOV     @(6),(6)        ;GET TRAP INSTRUCTION
023434  062716  117042                  ADD     #.TRP+2-TRAP,(6);GET DATA AND MAKE IT AN OFFSET
023440  013607                  .TRP:   MOV     @(6)+,PC        ;GO TO PROPER SUBROUTINE

023442  022222                          .SCOPE                  ;SCOPE  =  TRAP+0       (104400)
023444  022064                          .TYPE                   ;TYPE   =  TRAP+2       (104402)
023446  022566                          .TYPEO                  ;TYPEO  =  TRAP+4       (104404)
023450  022576                          .TYPES                  ;TYPES  =  TRAP+6       (104406)
023452  023126                          .RDOCT                  ;RDOCT  =  TRAP+10      (104410)
023454  023260                          .RDLIN                  ;RDLIN  =  TRAP+12      (104412)
023456  026050                          .CLRDK                  ;CLRDK  =  TRAP+14      (104414)
023460  027126                          .KBDIN                  ;KBDIN  =  TRAP+16      (104416)
023462  027006                          .SUSWR                  ;SUSWR  =  TRAP+20      (104420)
023464  027210                          .CNTLU                  ;CNTLU  =  TRAP+22      (104422)
```

```
3938                                    ;ROUTINE TO ALLOW THE OPERATOR TO SET BITS
3939                                    ;IN THE I/O REGISTERS VIA THE SWITCH REGISTER
3940
3941                                    ;WORD COUNT REGISTER
3942  023466  012706  000500            $RSWC:  MOV     #500,SP         ;SET UP STACK FOR TRAP CALL
3943  023472  104416                    1$:     KBDIN                   ;CHECK THE WORLD
3944  023474  017777  155326  155406            MOV     @SWR,@RSWC      ;MOV SWR INTO WORD COUNT REG
3945  023502  017777  155402  155320            MOV     @RSWC,@DISPLAY  ;DISPLAY IN LIGHTS
3946  023510  000770                            BR      1$
3947
3948                                    ;CURRENT ADDRESS REGISTER
3949  023512  012706  000500            $RSBA:  MOV     #500,SP         ;INIT THE STACK
3950  023516  104416                    1$:     KBDIN                   ;CTW
3951  023520  017777  155302  155364            MOV     @SWR,@RSBA      ;MOV SWR INTO CURRENT ADDR REG
3952  023526  017777  155360  155274            MOV     @RSBA,@DISPLAY  ;SHOW IN LIGHTS
3953  023534  000770                            BR      1$
3954
3955                                    ;DISK ADDRESS REGISTER
3956  023536  012706  000500            $RSDA:  MOV     #500,SP         ;INIT THE STACK
3957  023542  104416                    1$:     KBDIN                   ;CTW
3958  023544  017777  155256  155342            MOV     @SWR,@RSDA      ;MOV SWR INTO DISK ADDR REG
3959  023552  017777  155336  155250            MOV     @RSDA,@DISPLAY  ;SHOW IN LIGHTS
3960  023560  000770                            BR      1$
3961
3962                                    ;DRIVE STATUS REGISTER
3963  023562  012706  000500            $RSDS:  MOV     #500,SP         ;INIT THE STACK
3964  023566  104416                    1$:     KBDIN                   ;CTW
3965  023570  017777  155232  155320            MOV     @SWR,@RSDS      ;MOV SWR INTO DRIVE STATUS
3966  023576  017777  155314  155224            MOV     @RSDS,@DISPLAY  ;SHOW IN LIGHTS
3967  023604  000770                            BR      1$
3968
3969                                    ;DRIVE ERROR REGISTER
3970  023606  012706  000500            $RSER:  MOV     #500,SP         ;INIT THE STACK
3971  023612  104416                    1$:     KBDIN                   ;CTW
3972  023614  017777  155206  155276            MOV     @SWR,@RSER      ;LOAD ER REG
3973  023622  017777  155272  155200            MOV     @RSER,@DISPLAY  ;DISPLAY IT IN LIGHTS
3974  023630  000770                            BR      1$              ;LOOP
3975
3976                                    ;WATCH LOOK AHEAD REGISTER
3977  023632  017777  155266  155170  $RSLA:  MOV     @RSLA,@DISPLAY  ;SHOW IN LIGHTS
3978  023640  000774                            BR      $RSLA
```

```
 3979
 3980  023642  012706  000500          ;RSCS2 REGISTER
 3981  023646  104416          $RCS2:  MOV     #500,SP         ;INIT THE STACK
 3982  023650  017777  155152  155230  1$:     KBDIN           ;CTW
 3983  023656  017777  155224  155144          MOV     @SWR,@RSCS2     ;LOAD CS2
 3984  023664  000770                          MOV     @RSCS2,@DISPLAY ;DISPLAY IT
 3985                                          BR      1$
 3986
 3987  023666  012706  000500          ;RSAS REGISTER
 3988  023672  104416          $RAS:   MOV     #500,SP         ;INIT THE STACK
 3989  023674  017777  155126  155220  1$:     KBDIN           ;CTW
 3990  023702  017777  155214  155120          MOV     @SWR,@RSAS      ;LOAD RSAS
 3991  023710  000770                          MOV     @RSAS,@DISPLAY  ;DISPLAY IT
 3992                                          BR      1$
 3993
 3994  023712  012706  000500          ;RSMR REGISTER
 3995  023716  104416          $RSMRR: MOV     #500,SP         ;INIT THE STACK
 3996  023720  017777  155102  155202  1$:     KBDIN           ;CTW
 3997  023726  017777  155176  155074          MOV     @SWR,@RSMR      ;LOAD RSMR
 3998  023734  000770                          MOV     @RSMR,@DISPLAY  ;DISPLAY IT
 3999                                          BR      1$
 4000
 4001  023736  012706  000500          ;DISK CONTROL STATUS REGISTER
 4002  023742  104416          $RSCS1: MOV     #500,SP         ;INIT THE STACK
 4003  023744  012737  000340  177776  1$:     KBDIN           ;CTW
 4004  023752  012777  177777  155130          MOV     #340,@#PS       ;LOCK UP INTERRUPTS
 4005  023760  013777  001102  155124          MOV     #177777,@RSWC   ;SET WORD COUNT -1 WORD
 4006  023766  017777  155034  155110          MOV     @#OBUFSV,@RSBA  ;SET UP CURRENT ADDRESS
 4007  023774  032777  000001  155102          MOV     @SWR,@RSCS1     ;MOV SWR INTO CONTROL REG
 4008  024002  001757                          BIT     #BIT0,@RSCS1    ;IS FUNCTION BITS SET
 4009  024004  105777  155074          2$:     BEQ     1$              ;FUNCTION BITS NOT SET
 4010  024010  100375                          TSTB    @RSCS1          ;TEST FOR DISK READY
 4011  024012  000753                          BPL     2$              ;DISK STILL NOT READY
                                               BR      1$              ;DISK NOT BUSY SECT NEW CR
```

```
                                        ;THIS ROUTINE GIVES THE OPERATOR THE ABILITY TO
                                        ;SELECT DA, WC, UNIT # AND DESIRED PATTERN. PATTERN = NUMBER TYPED
                                        ;WITH SW12 SET THE PROGRAM WILL LOOP ON A READ WITH LOC OUTBUF+2 AS
                                        ;THE BA ADDR. WITH BIT12 0 IN THE SWR THE PROGRAM
                                        ;WILL WRITE WITH OUTBUF AS THE BA ADDR. BAI IS ALWAYS SET
                                        ;SWITCHES 0 TO 11 WILL DETERMINE THE DA
                                        ;EXAMPLE:        TYPE UNIT # 5
                                        ;                TYPE POSITIVE (OCTAL) WC 64
                                        ;                TYPE PATTERN DESIRED 1252525

024014  012706  000500          TKSEL:  MOV     #500,SP         ;SET STACK
024020  000240                          NOP
024022  104402  024026                  TYPE    ,.+2            ;.ASCIZ <15><12>"TYPE UNIT # "
024046  104410                          RDOCT
024050  012637  001152                  MOV     (6)+,UNNUM
024054  104402  024060                  TYPE    ,.+2            ;.ASCIZ <15><12>"TYPE POSITIVE (OCTAL) WC "
024114  104410                          RDOCT
024116  012637  001174                  MOV     (6)+,WORK
024122  005137  001174                  COM     WORK
024126  104402  024132                  TYPE    ,.+2            ;.ASCIZ <15><12>"TYPE PATTERN DESIRED "
024162  104410                          RDOCT
024164  012637  027364                  MOV     (6)+,OUTBUF
024170  042737  000001  027124          BIC     #BIT0,SWI       ;CLEAR THE BEENHEREBIT
024176  104420                          SUSWR                   ;INIT SWITCHLESS
024200  017737  154622  001200  TK1:    MOV     @SWR,WORK2      ;SAVE SWR
024206  104414                  TK2:    CLRDK                   ;CLEAR ALL RS REG
024210  052777  000010  154670          BIS     #BIT3,@RSCS2    ;SET BAI
024216  017737  154604  001176          MOV     @SWR,WORK1      ;GET SWR FOR DSK ADDR
024224  042737  170000  001176          BIC     #170000,WORK1   ;CLEAR UNIT #
024232  013777  001176  154654  TKKS:   MOV     WORK1,@RSDA     ;LOAD THE DA
024240  013777  001174  154642          MOV     WORK,@RSWC      ;LOAD WORD COUNT
024246  032777  010000  154552          BIT     #BIT12,@SWR     ;READ?
024254  001412                          BEQ     WTE             ;NO
024256  012777  027366  154626          MOV     #OUTBUF+2,@RSBA ;LOAD CURRENT ADDRESS
024264  012777  000071  154612          MOV     #71,@RSCS1      ;GO AND READ
024272  105777  154606          WT:     TSTB    @RSCS1          ;TEST FOR READY
024276  100375                          BPL     .-4
024300  000407                          BR      SWRCHG
024302  012777  027364  154602  WTE:    MOV     #OUTBUF,@RSBA
024310  012777  000061  154566          MOV     #61,@RSCS1
024316  000765                          BR      WT
024320  017777  154560  154502  SWRCHG: MOV     @RSCS1,@DISPLAY ;DISPLAY CS1
024326  005777  154552                  TST     @RSCS1          ;ANY ERRORS?
024332  100001                          BPL     1$              ;NO
024334  104014                          HLT     !DA!WC
024336  104416                  1$:     KBDIN                   ;CHECK FOR NEW VALUE
024340  027737  154462  001200          CMP     @SWR,WORK2      ;DID SWR CHANGE?
024346  001314                          BNE     TK1             ;YES
024350  000716                          BR      TK2             ;NO
```

```
4061                                    ;*****************************************************************************
4062                                    ;TEST 122                   WRITE LOCK TEST
4063                                    ;*****************************************************************************
4064  024352  104400                    TST122: SCOPE
4065
4066  024354                            WRTLCK:
4067  024354  104402  024360                    TYPE    ,.+2            ;.ASCIZ <15><12>"LOAD SW WITH UNIT # AND CONT"
4068  024420  022737  000176  001026            CMP     #SWREG,SWR
4069  024426  001402                            BEQ     7$              ;CHECK IF SWITCHLESS CPU
4070  024430  000000                            HALT
4071  024432  000401                            BR      8$              ;GO AROUND TRAP CALL
4072  024434  104422                    7$:     CNTLU                   ;GET SWREG VALUE
4073  024436  017737  154364  001152    8$:     MOV     @SWR,UNNUM      ;GET UNIT #
4074  024444  104414                            CLRDK                   ;CLEAR ALL REG
4075  024446  005037  027364                    CLR     OUTBUF          ;PUT A 0 INTO DATA BUFFER
4076  024452  012777  027364  154432            MOV     #OUTBUF,@RSBA   ;SETUP REG TO
4077  024460  012777  007700  154426            MOV     #7700,@RSDA     ;TO A WRITE
4078  024466  012777  177777  154414            MOV     #-1,@RSWC
4079  024474  012777  000061  154402            MOV     #61,@RSCS1
4080  024502  105777  154376            6$:     TSTB    @RSCS1          ;WAIT FOR DONE
4081  024506  100375                            BPL     6$
4082  024510  104402  024514                    TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRITE LOCK ENABLE AND CONTINUE"
4083  024562  000000                            HALT
4084  024564  012777  000000  154322    1$:     MOV     #0,@RSDA
4085  024572  022777  014600  154316            CMP     #14600,@RSDS
4086  024600  001401                            BEQ     .+4
4087  024602  104044                            HLT     !DS!DA          ;DS SHOULD=14600
4088  024604  012777  000100  154302            MOV     #100,@RSDA
4089  024612  022777  010600  154276            CMP     #10600,@RSDS
4090  024620  001401                            BEQ     .+4
4091  024622  104044                            HLT     !DS!DA          ;DS SHOULD=10600
4092  024624  104402  024630                    TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRT LOC SW 0 AND CONT"
4093  024664  000000                            HALT
4094  024666  022777  014600  154222    2$:     CMP     #14600,@RSDS
4095  024674  001401                            BEQ     .+4
4096  024676  104044                            HLT     !DS!DA          ;DS SHOULD=14600
4097  024700  012777  000300  154206            MOV     #300,@RSDA
4098  024706  022777  010600  154202            CMP     #10600,@RSDS
4099  024714  001401                            BEQ     .+4
4100  024716  104044                            HLT     !DS!DA          ;DS SHOULD=10600
4101  024720  104402  024724                    TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRT LOC SW 1 AND CONT"
4102  024760  000000                            HALT
4103  024762  022777  014600  154126    3$:     CMP     #14600,@RSDS
4104  024770  001401                            BEQ     .+4
4105  024772  104044                            HLT     !DS!DA          ;DS SHOULD=14600
4106  024774  012777  000700  154112            MOV     #700,@RSDA
4107  025002  022777  010600  154106            CMP     #10600,@RSDS
4108  025010  001401                            BEQ     .+4
4109  025012  104044                            HLT     !DS!DA          ;DS SHOULD=10600
4110  025014  104402  025020                    TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRT LCK SW 2 AND CONT"
4111  025054  000000                            HALT
```

```
4112  025056  022777  014600  154032  4$:     CMP     #14600,@RSDS
4113  025064  001401                          BEQ     .+4
4114  025066  104044                          HLT     !DS!DA          ;DS SHOULD=14600
4115  025070  012777  001700  154016          MOV     #1700,@RSDA
4116  025076  022777  010600  154012          CMP     #10600,@RSDS
4117  025104  001401                          BEQ     .+4
4118  025106  104044                          HLT     !DS!DA          ;DS SHOULD=10600
4119  025110  104402  025114                  TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRT LCK SW 3 AND CONT"
4120  025150  000000                  HALT:   HALT
4121  025152  022777  014600  153736          CMP     #14600,@RSDS
4122  025160  001401                          BEQ     .+4
4123  025162  104044                          HLT     !DS!DA          ;DS SHOULD=14600
4124  025164  012777  003700  153722          MOV     #3700,@RSDA
4125  025172  022777  010600  153716          CMP     #10600,@RSDS
4126  025200  001401                          BEQ     .+4
4127  025202  104044                          HLT     !DS!DA          ;DS SHOULD=10600
4128  025204  104402  025210                  TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRT LCK SW 4 AND CONT"
4129  025244  000000                          HALT
4130  025246  022777  014600  153642          CMP     #14600,@RSDS
4131  025254  001401                          BEQ     .+4
4132  025256  104044                          HLT     !DS!DA          ;DS SHOULD=14600
4133  025260  012777  006000  153626          MOV     #6000,@RSDA
4134  025266  022777  010600  153622          CMP     #10600,@RSDS
4135  025274  001401                          BEQ     .+4
4136  025276  104044                          HLT     !DS!DA          ;DS SHOULD=10600
4137  025300  104402  025304                  TYPE    ,.+2            ;.ASCIZ <15><12>"SET WRT LCK SW 5 AND CONT"
4138  025340  000000                          HALT
4139  025342  022777  014600  153546          CMP     #14600,@RSDS
4140  025350  001401                          BEQ     .+4
4141  025352  104044                          HLT     !DS!DA          ;DS SHOULD=14600
4142  025354  012777  007700  153532          MOV     #7700,@RSDA
4143  025362  022777  014600  153526          CMP     #14600,@RSDS
4144  025370  001401                          BEQ     .+4
4145  025372  104044                          HLT     !DS!DA          ;DS SHOULD=14600
4146  025374  012737  177777  027364          MOV     #-1,OUTBUF      ;PUT A 1 INTO DATA BUFFER
4147  025402  012777  027364  153502          MOV     #OUTBUF,@RSBA   ;SETUP REG TO
4148  025410  012777  007700  153476          MOV     #7700,@RSDA     ;TO A WRITE
4149  025416  012777  177777  153464          MOV     #-1,@RSWC
4150  025424  012777  000061  153452          MOV     #61,@RSCS1      ;TRY TO WRITE
4151  025432  105777  153446          7$:     TSTB    @RSCS1          ;WAIT FOR DONE
4152  025436  100375                          BPL     7$
4153  025440  105777  153440          5$:     TSTB    @RSCS1          ;WAIT FOR READY
4154  025444  100375                          BPL     5$
4155  025446  022777  154600  153442          CMP     #154600,@RSDS
4156  025454  001401                          BEQ     .+4
4157  025456  104044                          HLT     !DS!DA          ;DS SHOULD=154600
```

```
4158  025460  022777  004000  153432          CMP     #4000,@RSER
4159  025466  001401                          BEQ     .+4
4160  025470  104044                          HLT     !DS!DA          ;ER SHOULD=4000
4161  025472  104414                          CLRDK                   ;CLEAR ALL REG
4162  025474  022777  014600  153414          CMP     #14600,@RSDS    ;DID WLE CLEAR?
4163  025502  001401                          BEQ     .+4             ;NO
4164  025504  104040                          HLT     !DS             ;A CLEAR SHOULD NOT CLEAR WLE
4165  025506  005037  027364                  CLR     OUTBUF          ;PUT A 0 INTO DATA BUFFER
4166  025512  012777  027364  153372          MOV     #OUTBUF,@RSBA   ;SETUP REG TO
4167  025520  012777  007700  153366          MOV     #7700,@RSDA     ;TO A WRITE
4168  025526  012777  177777  153354          MOV     #-1,@RSWC
4169  025534  012777  000071  153342          MOV     #71,@RSCS1      ;DO A READ TO SEE IF DISK DID
4170  025542  105777  153336          8$:     TSTB    @RSCS1          ;ACTUALLY GET WRITTEN ON TO
4171  025546  100375                          BPL     8$              ;WAIT FOR DONE
4172  025550  005737  027364                  TST     OUTBUF          ;IS DATA STILL 0 ON THE DSK?
4173  025554  001401                          BEQ     .+4             ;YES
4174  025556  104040                          HLT     !DS             ;NO DSK DID GET WRITTEN ONTO WITH WLE SET
4175  025560  104402  025564                  TYPE    ,.+2            ;.ASCIZ <15><12>"RESET ALL W/L SWITCHES"
4176  025616  000000                          HALT
4177  025620  022777  010600  153270          CMP     #10600,@RSDS    ;DID WLE CLEAR
4178  025626  001401                          BEQ     .+4             ;YES
4179  025630  104040                          HLT     !DS             ;NO
4180
4181                          ;ROUTINE FOR FINDING MEMORY ON "B" PORT
4182  025632  012737  025716  000004  FINDM:  MOV     #MAXREF,4       ;SET UP I/O BUS TRAP
4183  025640  012737  000340  000006          MOV     #340,6          ;SET PS
4184  025646  032777  010000  153152          BIT     #BIT12,@SWR     ;INHIBIT OBUFSV FROM CHANGING?
4185  025654  001003                          BNE     EXREF           ;YES
4186  025656  062737  020000  001102          ADD     #20000,OBUFSV   ;ADD 4 K
4187  025664  005777  153212          EXREF:  TST     @OBUFSV         ;LEGAL LOC ? IF NO TRAPS
4188  025670  012737  000006  000004          MOV     #6,4            ;RESTORE I/O BUS TRAP
4189  025676  005037  000006                  CLR     6
4190  025702  022737  177446  001102          CMP     #177446,OBUFSV  ;TEST FOR GREATER THEN 28K
4191  025710  103403                          BLO     MAXRF1          ;YES
4192  025712  000137  006736                  JMP     WRTSTB          ;RETRY WRITING
4193  025716  022626                  MAXREF: CMP     (6)+,(6)+       ;CLEAR STACK
4194  025720  012737  000006  000004  MAXRF1: MOV     #6,4            ;RESTORE I/O BUS TRAP
4195  025726  005037  000006                  CLR     6
4196  025732  012737  027364  001102          MOV     #OUTBUF,OBUFSV  ;RESTORE ORIGINAL VALUE
4197  025740  032777  020000  153060          BIT     #BIT13,@SWR     ;INHIBIT TYPEOUT?
4198  025746  001031                          BNE     1$              ;YES
4199  025750  032737  020000  001160          BIT     #BIT13,ONCEE    ;DID WE TYPE THIS YET?
4200  025756  001025                          BNE     1$              ;YES
4201  025760  104402  025764                  TYPE    ,.+2            ;.ASCIZ <15><12>"COULD NOT FIND MEMORY ON -B- PORT"<15><
4202                          .EVEN
4203  026032  052737  020000  001160  1$:     BIS     #BIT13,ONCEE    ;SET TYPE FLAG
4204  026040  104400                          SCOPE                   ;UPDATE
4205  026042  104400                          SCOPE                   ;TEST NUMBERS
4206  026044  000137  007526                  JMP     NXM             ;CONT TESTING
4207
4208                          ;CLEAR ALL DISK REGISTERS
4209  026050  012777  000040  153030  .CLRDK: MOV     #40,@RSCS2      ;CLEAR ALL DSK REG
4210  026056  013777  001152  153022          MOV     UNNUM,@RSCS2    ;GET UNIT NUMBER
4211  026064  000002                          RTI
```

```
                                        ;ERROR TYPTXTOUT ROUTINE
                                
026066  005737  022554          RSREG:  TST     .HLTCT          ;SHOULD WE TYPTXT GOOD AND BAD
026072  001021                          BNE     8$              ;NO
026074  104402  026100                  TYPE    .+2             ;.ASCIZ " BAD="
026106  010046                          MOV     BAD,-(6)        ;PUT BAD ON STACK
026110  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026112  104402  026116                  TYPE    .+2             ;.ASCIZ " GOOD="
026126  010146                          MOV     GOOD,-(6)       ;PUT GOOD ON STACK
026130  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026132  000137  026570                  JMP     PTDONE          ;GET OUT
026136                          8$:
026136  104402  026142                  TYPE    .+2             ;.ASCIZ " CS1="
026150  017746  152730                  MOV     @RSCS1,-(6)     ;PUT @RSCS1 ON STACK
026154  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026156                          1$:
026156  104402  026162                  TYPE    .+2             ;.ASCIZ " ER="
026170  017746  152724                  MOV     @RSER,-(6)      ;PUT @RSER ON STACK
026174  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026176                          2$:
026176  104402  026202                  TYPE    .+2             ;.ASCIZ " CS2="
026210  017746  152672                  MOV     @RSCS2,-(6)     ;PUT @RSCS2 ON STACK
026214  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026216  032737  000200  022554          BIT     #200,.HLTCT     ;TYPTXT SECOND SET ?
026224  001076                          BNE     SEEC            ;YES
026226  032737  000100  022554          BIT     #AS,.HLTCT      ;TYPTXT ER ?
026234  001410                          BEQ     3$              ;NO
026236  104402  026242                  TYPE    .+2             ;.ASCIZ " AS="
026250  017746  152646                  MOV     @RSAS,-(6)      ;PUT @RSAS ON STACK
026254  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026256  032737  000020  022554  3$:     BIT     #BA,.HLTCT      ;TYPTXT BUS ASSRESS
026264  001410                          BEQ     4$              ;NO
026266  104402  026272                  TYPE    .+2             ;.ASCIZ " BA="
026300  017746  152606                  MOV     @RSBA,-(6)      ;PUT @RSBA ON STACK
026304  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026306  032737  000004  022554  4$:     BIT     #DA,.HLTCT      ;TYPTXT DA ?
026314  001410                          BEQ     5$              ;NO
026316  104402  026322                  TYPE    .+2             ;.ASCIZ " DA="
026330  017746  152560                  MOV     @RSDA,-(6)      ;PUT @RSDA ON STACK
026334  104404                          TYPEO                   ;TYPE STACK IN OCTAL
026336  032737  000010  022554  5$:     BIT     #WC,.HLTCT      ;TYPTXT WC?
026344  001410                          BEQ     6$              ;NO
026346  104402  026352                  TYPE    .+2             ;.ASCIZ " WC="
026360  017746  152524                  MOV     @RSWC,-(6)      ;PUT @RSWC ON STACK
026364  104404                          TYPEO                   ;TYPE STACK IN OCTAL
```

```
4257  026366  032737  000040  022554  6$:     BIT     #DS,.HLTCT      ;DRIVE STATUS
4258  026374  001475                          BEQ     PTDONE          ;NO
4259  026376  104402  026402                  TYPE    .+2             ;.ASCIZ " DS="
4260  026410  017746  152502                  MOV     @RSDS,-(6)      ;PUT @RSDS ON STACK
4261  026414  104404                          TYPEO                   ;TYPE STACK IN OCTAL
4262  026416  000137  026570                  JMP     PTDONE          ;GET OUT
4263  026422  042737  000200  022554  5$EC:   BIC     #200,.HLTCT     ;CLEAR COMMON BIT
4264  026430  032737  000240  022554          BIT     #DT,.HLTCT      ;TYPTXT DRIVE TYPE?
4265  026436  001410                          BEQ     9$              ;NO
4266  026440  104402  026444                  TYPE    .+2             ;.ASCIZ " DT="
4267  026452  017746  152454                  MOV     @RSDT,-(6)      ;PUT @RSDT ON STACK
4268  026456  104404                          TYPEO                   ;TYPE STACK IN OCTAL
4269  026460  032737  000210  022554  9$:     BIT     #DB,.HLTCT      ;TYPTXT DATA BUFFER
4270  026466  001410                          BEQ     10$             ;NO
4271  026470  104402  026474                  TYPE    .+2             ;.ASCIZ " DB="
4272  026502  017746  152420                  MOV     @RSDB,-(6)      ;PUT @RSDB ON STACK
4273  026506  104404                          TYPEO                   ;TYPE STACK IN OCTAL
4274  026510  032737  000220  022554  10$:    BIT     #MR,.HLTCT      ;TYPTXT MN?
4275  026516  001410                          BEQ     11$             ;NO
4276  026520  104402  026524                  TYPE    .+2             ;.ASCIZ " MR="
4277  026532  017746  152372                  MOV     @RSMR,-(6)      ;PUT @RSMR ON STACK
4278  026536  104404                          TYPEO                   ;TYPE STACK IN OCTAL
4279  026540  032737  000204  022554  11$:    BIT     #LA,.HLTCT      ;TYPTXT LA?
4280  026546  001410                          BEQ     PTDONE          ;NO
4281  026550  104402  026554                  TYPE    .+2             ;.ASCIZ " LA="
4282  026562  017746  152336                  MOV     @RSLA,-(6)      ;PUT @RSLA ON STACK
4283  026566  104404                          TYPEO                   ;TYPE STACK IN OCTAL
4284  026570  052737  100000  001160  PTDONE: BIS     #BIT15,ONCEE    ;SET FORND ERROR FLAG
4285  026576  000207                          RTS     PC
4286
4287  026600  005037  001174          WAITRY: CLR     WORK            ;CLEAR COUNTER
4288  026604  105777  152274          1$:     TSTB    @RSCS1          ;TEST READY
4289  026610  100406                          BMI     2$              ;OK CONT
4290  026612  005237  001174                  INC     WORK            ;UPDATE COUNTER
4291  026616  005737  001174                  TST     WORK            ;DONE YET?
4292  026622  001403                          BEQ     3$              ;READY DID NOT COME UP
4293  026624  000767                          BR      1$              ;CONTINUE WAITING
4294  026626  062716  000002          2$:     ADD     #2,(SP)         ;UPDATE RETURN PC
4295  026632  000207                  3$:     RTS     PC              ;RETURN
```

```
4296                                        ;RANDOM DATA GENERATOR SUBROUTINE
4297
4298  026634  013737  026776  027002  RANDOM: MOV     LONUM,LOSAV
4299  026642  013737  027000  027004          MOV     HINUM,HISAV
4300  026650  013700  026776          RAND1:  MOV     LONUM,R0        ;SET UP R0 WITH 5 DIGITS LOW
4301  026654  013704  027000                  MOV     HINUM,R4        ;SET UP R1 WITH 5 DIGITS HIGH
4302  026660  012703  000007                  MOV     #7,R3           ;SET UP SHIFT COUNT
4303  026664  005002                          CLR     R2              ;CLEAR R2
4304  026666  006300                  SHIFT:  ASL     R0              ;SHIFT R0 LEFT AND
4305  026670  006104                          ROL     R4              ;ROTATE CARRY INTO LSB OF R1 INTO
4306  026672  006102                          ROL     R2              ;ROTATE CARRY OUT OF R1 INTO R2
4307  026674  005303                          DEC     R3              ;DECREMENT R3
4308  026676  001373                          BNE     SHIFT           ;CONTINUE SHIFT LOOP
4309  026700  063700  026776                  ADD     LONUM,R0        ;ADDN IN NUMBER TO MAKE X 129
4310  026704  005504                          ADC     R4              ;PROPOGATE CARRY
4311  026706  063704  027000                  ADD     HINUM,R4        ;ADDN IN NUMBER TO MAKE X 129
4312  026712  005502                          ADC     R2              ;PROPOGATE CARRY
4313  026714  062700  001057                  ADD     #1057,R0        ;ADDN LOW CONSTANT
4314  026720  005504                          ADC     R4              ;PROPOGATE CARRIES
4315  026722  005502                          ADC     R2              ;PROPOGATE AGAIN
4316  026724  062704  047401                  ADD     #47401,R4       ;ADDN HIGH CONSTANT
4317  026730  005502                          ADC     R2              ;PROPOGATE CARRY
4318  026732  062702  000006                  ADD     #6,R2           ;ADDN HIGHEST CONSTANT
4319  026736  062700  000002                  ADD     #2,R0           ;REPRIME R0 WITH HIGH DIGIT
4320  026742  005504                          ADC     R4              ;PROPOGATE CARRY
4321  026744  010037  026776                  MOV     R0,LONUM        ;PUT R0 BACK IN LONUM
4322  026750  010021                          MOV     R0,(R1)+        ;LOAD WC
4323  026752  005337  001174                  DEC     WORK
4324  026756  001406                          BEQ     EXGEN
4325  026760  010437  027000                  MOV     R4,HINUM        ;PUT R1 BACK IN HINUM
4326  026764  010421                          MOV     R4,(1)+         ;HOLD HINUM FOR PROGRAM
4327  026766  005337  001174                  DEC     WORK
4328  026772  001326                          BNE     RAND1
4329  026774  000205                  EXGEN:  RTS     R5              ;RETURN TO PROGRAM
4330  026776  000000                  LONUM:  0
4331  027000  000000                  HINUM:  0
4332  027002  000000                  LOSAV:  0
4333  027004  000000                  HISAV:  0
4334  027006                          RANEND:
4335
4336  027006  032737  000001  027124  .SUSWR: BIT     #BIT0,SWI
4337  027014  001037                          BNE     XXX
4338  027016  013746  000006                  MOV     6,-(SP)         ;SAVE 6 ON STACK
4339  027022  013746  000004                  MOV     4,-(SP)         ;SAVE 4 ON STACK
4340  027026  012737  027046  000004          MOV     #1$,4           ;SET UP TRAP ADDRESS
4341  027034  022777  177777  151764          CMP     #-1,@SWR        ;TEST 177570
4342  027042  001402                          BEQ     2$              ;FAKE OUT
4343  027044  000407                          BR      3$              ;HARDWARE AVAILABLE
4344  027046  022626                  1$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
4345  027050  012737  000176  001026  2$:     MOV     #SWREG,SWR      ;SET UP SOFTWARE REGISTERS
4346  027056  012737  000174  001030          MOV     #DISPREG,DISPLAY
4347  027064  022737  000176  001026  3$:     CMP     #SWREG,SWR      ;1ST TIME THRU?
4348  027072  001004                          BNE     4$              ;NO CHANGE STILL 177570
4349  027074  005737  000042                  TST     42              ;ANY XXDP OR ACT
4350  027100  001001                          BNE     4$              ;SWR=000000
4351  027102  104422                          CNTLU                   ;GET INITIAL SETTINGS
```

```
4352  027104  012637  000004          4$:     MOV     (SP)+,4         ;REPLACE 4 FROM STACK
4353  027110  012637  000006                  MOV     (SP)+,6         ;REPLACE 6 FROM STACK
4354  027114  052737  000001  027124  XXX:    BIS     #BIT0,SWI       ;SET THE BEENHEREBIT
4355  027122  000002                          RTI                     ;ALL DONE
4356
4357  027124  000000                  SWI:    0
4358
4359
4360
4361  027126  005737  000042          .KBDIN: TST     42              ;GOT XXDP OR ACT
4362  027132  001057                          BNE OKT                 ;YES,GET OUT
4363  027134  022737  000176  001026          CMP     #SWREG,SWR      ;GOT SWITCH-LESS MACHINE?
4364  027142  001053                          BNE     OKT             ;NO GET OUT
4365  027144  105777  151650                  TSTB    @TKS            ;HAVE A CHARACTER
4366  027150  100050                          BPL     OKT             ;NO GET OUT
4367  027152  017737  151644  027274          MOV     @TKB,.MSG
4368  027160  042737  177600  027274          BIC     #177600,.MSG    ;STRIP OFF GARBAGE
4369  027166  122737  000007  027274          CMPB    #7,.MSG         ;DO WE HAVE A ↑G
4370  027174  001036                          BNE OKT                 ;NO,GET OUT
4371  027176  104402  027202                  TYPE    ,.+2            ;.ASCIZ <15><12>"↑G"
4372  027210                          .CNTLU:
4373  027210  104402  027214                  TYPE    .+2             ;.ASCIZ <15><12>"SWR= "
4374  027224  013746  000176                  MOV     $WREG,-(6)      ;PUT SWREG ON STACK
4375  027230  104404                          TYPEO                   ;TYPE STACK IN OCTAL
4376  027232  104402  027236                  TYPE    ,.+2            ;.ASCIZ "   NEW= "
4377  027250  104410                          RDOCT
4378  027252  012637  027274                  MOV     (SP)+,.MSG      ;GET NEW VALUE OFF STACK
4379  027256  005737  027276                  TST     CTN             ;DID HE TYPE <CR> OF 000000?
4380  027262  001403                          BEQ     OKT             ;DONT CHANGE IF <CR>
4381  027264  013737  027274  000176          MOV     .MSG,SWREG      ;CHANGE VALUE OF SWREG
4382  027272  000002                  OKT:    RTI                     ;ALL DONE-EXIT
4383
4384  027274  000000                  .MSG:   0
4385  027276  000000                  CTN:    0
```

```
 4386
 4387                                   ;TABLES FOR ILLEGAL FUNCTION TESTS
 4388
 4389  027300  000003                   ILLTAB: 3
 4390  027302  000005                           5
 4391  027304  000007                           7
 4392  027306  000013                           13
 4393  027310  000015                           15
 4394  027312  000017                           17
 4395  027314  000023                           23
 4396  027316  000025                           25
 4397  027320  000027                           27
 4398  027322  000033                           33
 4399  027324  000035                           35
 4400  027326  000037                           37
 4401  027330  000041                           41
 4402  027332  000043                           43
 4403  027334  000045                           45
 4404  027336  000047                           47
 4405  027340  000000                           0
 4406
 4407  027342  000053                   ILFTB2: 53
 4408  027344  000055                           55
 4409  027346  000057                           57
 4410  027350  000063                           63
 4411  027352  000065                           65
 4412  027354  000073                           73
 4413  027356  000075                           75
 4414  027360  000077                           77
 4415  027362  000000                           0
 4416  027364  000300                   OUTBUF: .BLKW   300
 4417  030164  000300                   INBUF:  .BLKW   300
 4418          000001                           .END
```

```
ADDCF   012120          2350    2359#
AS    = 000100           743#     954    1507    1517    1539    1570    1583    1605    1648    2073    2131    2290    2604
                        2878    2918    3011    3018    3055    3076    3082    3548    3568    3574    3597    3601    3604
                        4237
ATA   = 100000           764#
AOB1    001166           778#
BA    = 000020           741#     924     982     988    1070    1074    1078    1100    1339    1343    1504    1536    1567
                        1602    1668    2079    2134    2201    2216    3052    3115    4242
BAD   =%000000           671#    1047*   1086*   1087    1124*   1125    1161*   1162    1257*   1271*   1286*   1316*   1317
                        1353*   1354*   1357    1367*   1369    1383*   1384    1390*   1391    1395*   1396    1410*   1411
                        1418*   1419    1440*   1442    1465*   1466    1473*   1474    1625*   1626*   1629    1689*   1690
                        1693*   1696    1730*   1731    1734*   1737    1740*   1742    1765*   1766    1778*   1781    1826*
                        1827    1830*   1833    1862*   1863    1866*   1869    1873*   1875    1897*   1898    1910*   1913
                        1956*   1957    1960*   1963    1983*   1984    2008*   2009    2016*   2019    2068*   2100*   2104
                        2105*   2106    2110*   2111    2120*   2123    2128*   2129    2163*   2167    2172    2173*   2174
                        2178*   2179    2193*   2196    2206*   2209    2242*   2244    2249*   2250    2268*   2269    2274*
                        2275    2331*   2332*   2333    2368*   2369*   2371*   2376    2412*   2415    2466*   2469    2472*
                        2482*   2485    2491*   2492    2543*   2546    2549*   2559*   2562    2568*   2569    2607*   2608
                        2619*   2620    2802*   2805    2809*   2810    2823*   2824    2908*   2910    3006*   3009    3035*
                        3038    3067*   3070    3077*   3080    3090*   3093    3137*   3140    3172*   3175*   3176    3282*
                        3283    3346*   3384*   3427*   3449*   3542*   3543*   3545    3554*   3555    3558*   3561    4217
BAI   = 000010           767#    1978    1991    2000    3102    3125    3159    3243
BAITST  007754          1975#
BEGIN   001202           618     636     798#    3633
BELL  = 000007           645#    3628    3732
BITBA   004350          1335#
BITCS2  004234          1311#
BITST   004162          1298#
BITWC   004300          1323#
BIT0  = 000001           654#     871     889    1283    1669    1719    1772    1851    1904    2105    2173    4007    4034
                        4336    4354
BIT1  = 000002           655#
BIT10 = 002000           664#
BIT11 = 004000           617     635     665#    809    1809
BIT12 = 010000           666#    1807    2928    2931    4043    4184
BIT13 = 020000           667#     829     855     875    2515    4197    4199    4203
BIT14 = 040000           604      668#   2449    2474    2498    2501    2505    2526    2551    2575    2578    2583
BIT15 = 100000           669#     832     857     864    1368    3543    4284
BIT2  = 000004           656#
BIT3  = 000010           657#    3512    3518    3580    4038
BIT4  = 000020           658#    3065    3106    3131    3166
BIT5  = 000040           659#
BIT6  = 000100           660#    3175
BIT7  = 000200           661#    2728
BIT8  = 000400           662#
BIT9  = 001000           663#    2349    2353
BLOCK   010206          2028#
BPORTT  001170           781#    1916*   2518    2520*   2528*   2533*   2535*   2549    2580*
CHCKDV  001650           867      871#
CLRDK = 104414          1012    1298    1344    1352    1377    1402    1448    1485    1513    1548    1579    1619    1658
                        1709    1753    1796    1841    1884    1925    1975    1990    1999    2028    2098    2141    2160
                        2220    2234    2256    2298    2303    2347    2403    2442    2488    2502    2519    2565    2579
                        2589    2631    2655    2668    2686    2693    2711    2717    2742    2753    2827    2847    2865
                        2882    2894    2937    2960    2972    2995    3004    3064    3086    3101    3124    3149    3158
                        3185    3197    3220    3232    3292    3349    3398    3423    3445    3473    3496    3934#   4037
                        4074    4161
```

```
CNTLU = 104422          3937#   4072    4351
CSTST   012050          2345#
CS1   = 000001           737#    919     977    1017    1021    1025    1033    1303    1307    1362    1366    1492    1524
                        1555    1590    1645    1672    1674    1680    1716    1718    1724    1760    1762    1804    1806
                        1817    1848    1850    1856    1892    1894    1903    1941    1944    1981    2014    2057    2079
                        2116    2119    2134    2137    2140    2184    2187    2190    2201    2204    2216    2219    2481
                        2497    2558    2574    2598    2601    2613    2642    2676    2701    2732    2787    2853    2881
                        2950    2959    2985    2994    3029    3210    3219    3407    3413    3432    3462
CS2   = 000200           744#    911     973    1043    1053    1057    1062    1359    1371    1388    1413    1424    1436
                        2021    2622    2915    2922
CTN     027276          3854*   3871*   4379    4385#
DA    = 000004           739#    930    1145    1149    1153    1174    1501    1533    1564    1599    1634    1677    1680
                        1686    1721    1771    1774    1814    1823    1853    1906    1944    1947    1953    2140    2190
                        2648    2801    2856    3049    3148    3184    3321    3568    3574    3578    4056    4087    4091
                        4096    4100    4105    4109    4114    4118    4123    4127    4132    4136    4141    4145    4157
                        4160    4247
DAO   = 001000           765#
DAOTST  015514          2937#
DAOTT   015672          2972#
DB    = 000210           746#    4269
DCK   = 100000           766#
DCKTST  014364          2753#
DISPLA  001030           686#   3710*   3714*   3945*   3952*   3959*   3966*   3973*   3977*   3983*   3990*   3997*   4053*
                        4346*
DISPRE  000174           607#    4346
DKADR   015054          2847#
DLT   = 100000           759#    1434
DONCS   012236          2363    2383#
DONE    021762           883    3622#
DONEE   002016           872     883#
DONINT  020760          3459    3463#
DRCLR   005754          1619#
DRY   = 000200           760#    2040    2050
DS    = 000040           742#    915     1527    1573    1593    1611    1680    1686    1701    1721    1724    1771    1823
                        1853    1944    1953    1989    2005    2042    2046    2054    2057    2076    2084    2116    2119
                        2144    2147    2184    2187    2223    2226    2259    2284    2287    2302    2309    2381    2420
                        2481    2558    2616    2625    2651    2654    2661    2682    2685    2707    2710    2738    2741
                        2745    2798    2801    2878    2907    2926    2956    2963    2991    2998    3014    3043    3076
                        3085    3112    3145    3148    3152    3181    3184    3188    3191    3216    3223    3321    3458
                        3480    3484    3548    3578    3601    3604    4087    4091    4096    4100    4105    4109    4114
                        4118    4123    4127    4132    4136    4141    4145    4157    4160    4164    4174    4179    4257
DT    = 000240           748#    4264
DVNUM   001346           823     826#
DVTAB   022044          3502    3529    3637#
ER    = 000002           738#    936     994    1182    1186    1193    1199    1206    1495    1542    1558    1608    1637
                        1680    1721    1724    1771    1853    1944    1993    2116    2119    2184    2187    2255    2280
                        2302    2306    2381    2481    2558    2645    2651    2658    2679    2682    2704    2707    2735
                        2738    2795    2830    2875    2885    2953    2966    2988    3022    3034    3058    3089    3136
                        3171    3213    3285    3321    3325    3337    3341    3360    3363    3375    3379    3458    3480
                        3484    3578
ERINT   020762          3470#
ERR   = 040000           763#
ERRINT  021052          3472    3482#
ERRORS  001002           676#   3733*   3753
ERRR    012002          2330    2336#
ERTST   016036          3004#
```

```
EXGEN   026774          4324    4329#
EXREF   025664          4185    4187#
EXTRP   020412          3300    3376    3382    3387#
EXTTRP  020420          3295    3389#
EXTTST  017676          3292#
EXTTI   020220          3349#
EXTI    020422          3388    3390#
FILCHR  001014           680#   3658    3659
FINDM   025632          1811    4182#
FINTST  021066          3481    3486#
FLOTBA  003052          1083#
FLOTDA  003352          1158#
FLOTWC  003212          1121#
FUNDO   016620          3124#
GOOD  =%000001           670#   1048*   1083*   1085    1087    1090*   1121*   1123    1125    1128*   1158*   1160    1162
                        1165*   1258*   1272*   1287*   1314*   1315*   1317    1355*   1356*   1357    1368*   1369    1381*
                        1382*   1384    1389*   1391    1394*   1396    1408*   1409*   1411    1414*   1415*   1416    1419
                        1441*   1442    1450*   1451    1452*   1455*   1457    1458*   1464*   1466    1469*   1472*   1474
                        1478*   1627*   1628*   1629    1687*   1688*   1690    1694*   1695*   1696    1728*   1729*   1731
                        1735*   1736*   1737    1741*   1742    1763*   1764*   1766    1779*   1780*   1781    1824*   1825*
                        1827    1831*   1832*   1833    1860*   1861*   1863    1867*   1868*   1869    1874*   1875    1895*
                        1896*   1898    1911*   1912*   1913    1954*   1955*   1957    1961*   1962*   1963    1982*   1984
                        2006*   2007*   2009    2017*   2018*   2019    2047*   2048*   2059*   2061*   2066    2070    2106*
                        2109*   2111    2121*   2122*   2123    2126*   2127*   2129    2174*   2177*   2179    2194*   2195*
                        2196    2207*   2208*   2209    2243*   2244    2247*   2248*   2250    2267*   2269    2272*   2273*
                        2275    2327*   2328*   2333    2348*   2351*   2374*   2375*   2376    2413*   2414*   2415    2467*
                        2468*   2469    2473*   2476*   2483*   2484*   2485    2489*   2490*   2492    2544*   2545*   2546
                        2550*   2553*   2560*   2561*   2562    2566*   2567*   2569    2605*   2606*   2608    2618*   2620
                        2803*   2804*   2805    2808*   2810    2813*   2816*   2820*   2822*   2824    2896*   2899*   2903
                        2909*   2910    3007*   3008*   3009    3036*   3037*   3038    3068*   3069*   3070    3078*   3079*
                        3080    3091*   3092*   3093    3138*   3139*   3140    3173*   3174*   3176    3280*   3281*   3283
                        3345*   3383*   3436*   3450*   3544*   3545    3552*   3553*   3555    3559*   3560*   3561    4220
HALT    025150          4120#
HINUM   027000          4299    4301    4311    4325*   4331#
HISAV   027004          4299*   4333#
HLT   = 104000           642#    911     915     919     924     930     936     942     948     954     973     977     982
                         988     994     999    1004    1017    1021    1025    1033    1043    1049    1053    1057    1062
                        1070    1074    1078    1089    1100    1108    1112    1116    1127    1137    1145    1149    1153
                        1164    1174    1182    1186    1193    1199    1206    1216    1223    1231    1239    1259    1273
                        1288    1303    1307    1319    1327    1331    1339    1343    1359    1362    1366    1371    1388
                        1393    1398    1413    1421    1424    1436    1444    1468    1476    1492    1495    1498    1501
                        1504    1507    1517    1524    1527    1530    1533    1536    1539    1542    1555    1558    1561
                        1564    1567    1570    1573    1583    1590    1593    1596    1599    1602    1605    1608    1611
                        1631    1634    1637    1642    1645    1648    1651    1665    1668    1672    1674    1677    1680
                        1683    1686    1692    1698    1701    1716    1718    1721    1724    1727    1733    1739    1744
                        1760    1762    1768    1771    1774    1777    1783    1804    1806    1814    1817    1820    1823
                        1829    1835    1848    1850    1853    1856    1859    1865    1871    1877    1892    1894    1900
                        1903    1906    1909    1915    1941    1944    1947    1950    1953    1959    1965    1981    1986
                        1989    1993    2005    2011    2014    2021    2037    2042    2046    2054    2057    2069    2073
                        2076    2079    2082    2084    2113    2116    2119    2125    2131    2134    2137    2140    2144
                        2147    2181    2184    2187    2190    2198    2201    2204    2211    2216    2219    2223    2226
                        2246    2252    2255    2259    2271    2277    2280    2284    2287    2290    2302    2306    2309
                        2321    2338    2355    2378    2381    2417    2420    2471    2477    2481    2487    2494    2497
                        2548    2554    2558    2564    2571    2574    2598    2601    2604    2610    2613    2616    2622
                        2625    2642    2645    2648    2651    2654    2658    2661    2676    2679    2682    2685    2701
                        2704    2707    2710    2732    2735    2738    2741    2745    2787    2795    2798    2801    2807
```

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                    2812    2826    2830    2853    2856    2875    2878    2881    2885    2907    2912    2915    2918
                    2922    2926    2950    2953    2956    2959    2963    2966    2985    2988    2991    2994    2998
                    3011    3014    3018    3022    3029    3034    3040    3043    3046    3049    3052    3055    3058
                    3072    3076    3082    3085    3089    3095    3112    3115    3118    3136    3142    3145    3148
                    3152    3171    3178    3181    3184    3188    3191    3210    3213    3216    3219    3223    3285
                    3321    3325    3337    3341    3347    3360    3363    3375    3379    3385    3407    3413    3432
                    3437    3457    3458    3462    3480    3484    3547    3548    3551    3557    3563    3568    3574
                    3578    3597    3601    3604    4056    4087    4091    4096    4100    4105    4109    4114    4118
                    4123    4127    4132    4136    4141    4145    4157    4160    4164    4174    4179
HLTADR  001012       679#  3737*   3738*   3739    3740    3754
IAERR   015130      2865#
ICNT    001000       675#   805*   3618*   3688    3703    3705    3707*   3708*   3710    3713*   3714    3720    3749*
IE    = 000100       768#
ILFDN   010762      2101    2149#
ILFDNE  011332      2164    2228#
ILFTB2  027342      2161    4407#
ILF67   011334      2234#
ILLFUN  010764      2160#
ILLTAB  027300      2099    4389#
ILLS1   010506      2096#
INBUF   030164      4417#
INCW    014576      2785#
INPUT   023402      3855    3890    3891    3914#
INTDON  020642      3433    3438#
INTR4   020644      3444#
INTRS   020540      3421#
INT112  020634      3424    3436#
INT114  020746      3446    3460#
IR    = 000100       754#
KBDIN = 104416      3685    3729    3935#   3943    3950    3957    3964    3971    3981    3988    3995    4002    4057
KIPAR0= 172340       716#  3302*
KIPAR1= 172342       717#  3303*
KIPAR2= 172344       718#  3304*   3350*
KIPAR7= 172356       719#  3301*
KIPDR0= 172300       720#  3305*
KIPDR1= 172302       721#  3306*
KIPDR2= 172304       722#  3307*
KIPDR7= 172316       723#  3308*
LA    = 000204       745#  2321    2338    4279
LAD     001010       678#   806*   1249*   1263*   1277*   3709*   3715    3717    3720
LASTSC  017166      3197#
LATDON  012046      2335    2339#
LATST   011724      2319#
LBT   = 002000       762#
LONUM   026776      4298    4300    4309    4321*   4330#
LOP1    003772      1249    1250#
LOP2    004042      1263    1264#
LOP3    004112      1277    1278#
LOSAV   027002      4298*   4332#
MAXREF  025716      4182    4193#
MAXRF1  025720      4191    4194#
MEMOUT  020426      3391#
MODDON  021732      3615#
MODNUM  021070      3496#
MPRO  = 172100       780#  2392
MR    = 000220       747#   942     999    1216    1223    1231    1239    1642    2037    2355    2381    4274
```

```
MULTII  001316          819#
N     = 000123          641#    814     818#    892     896#    955     959#   1005    1009#   1026    1027#   1035    1039#
                       1064    1065#   1080    1081#   1092    1093#   1101   1102#   1117    1118#   1131    1132#   1138
                       1139#   1154    1155#   1168    1169#   1175    1176#  1188    1189#   1194    1195#   1200    1201#
                       1207    1208#   1217    1218#   1224    1225#   1232   1233#   1240    1244#   1293    1297#   1309
                       1310#   1321    1322#   1333    1334#   1345    1349#  1372    1376#   1399    1400#   1445    1446#
                       1480    1484#   1508    1512#   1543    1547#   1574   1578#   1612    1616#   1653    1657#   1704
                       1708#   1745    1749#   1791    1795#   1836    1840#  1878    1882#   1920    1924#   1970    1974#
                       1994    1998#   2023    2027#   2086    2090#   2150   2154#   2229    2233#   2292    2296#   2314
                       2318#   2322    2323#   2340    2344#   2384    2388#  2433    2437#   2506    2510#   2584    2588#
                       2626    2630#   2663    2667#   2688    2692#   2712   2716#   2746    2750#   2842    2846#   2858
                       2862#   2889    2893#   2932    2936#   2967    2971#  2999    3003#   3059    3063#   3096    3100#
                       3120    3124#   3153    3157#   3192    3196#   3228   3232#   3287    3291#   3393    3397#   3416
                       3420#   3439    3443#   3465    3469#   3487    3491#  4061    4065#
NED   = 010000           757#   2920    2924
NEDDON  015422         2901    2928#
NEDTST  015244         2894#
NNDD    015504         2927    2929    2931#
NNOOP   005244         1513#
NNOP21  005562         1579#
NOOP    005120         1485#
NOOP21  005424         1548#
NOPAR   012446         2421    2427    2431#
NOWGO   002022          865     882     888#
NXM     007526         1916#   4206
NXMTSM  010060         1999#
OBUFSV  001102          690#    808*    888*   1487    1502    1519   1534    1550    1565    1585    1600    1660    1666
                       1694    1711    1735    1755    1779    1797   1799    1831    1843    1867    1872    1885    1887
                       1911    1916    1917*   1931    1961    1976   1982    2030    2077    2102    2132    2165    2199
                       2212    2236    2243    2261    2267    2444   2460    2483    2518*   2521    2537    2560    2582*
                       2591    2632    2669    2694    2718    2764   2771    2788    2832    2849    2867    2947    2982
                       3024    3050    3104    3113    3127    3161   3207    3234    3249    3261    3267    3429    3452
                       3477    3526    3559    4005    4186*   4187   4190    4196*
                       4362    4364    4366    4370    4380    4382#
OKT     027272
ONCEE   001160          617*    635*    775#    807*    809     832*   857     864*    871     889*   2449    2474    2498
                       2501*   2505*   2515    2526    2551    2575   2578*   2583*   2928    2931*   4199    4203*   4284*
OOUT    010504         2043    2083    2085#
OR    = 000200          755#   1422
OUT     021756         3619#
OUTBUF  027364          808     888    1246    1248    1262    1276   1486*   1518*   1549*   1584*   1659*   1710*   1740
                       1754*   1917    1930*   2404*   2443*   2451*  2453*   2456*   2458*   2472    2503*   2530*   2582
                       2590*   2763*   2770*   2813    3023*   3103*  3126*   3160*   3233*   3248*   3525*   4033*   4045
                       4050    4075*   4076    4146*   4147    4165*  4166    4172    4196    4416#
PART    012240         2389#
PARTST  011646         2297#
PATST   016332         3064#
PATTST  016772         3158#
PC    =%000007          653#   1673*   1717*   1761*   1805*   1849*  1893*   1940*   1980*   2004*   2597*   2641*   2675*
                       2700*   2852*   2949*   2984*   3209*   3431*  3479*   3743*   3926*   4285*   4295*
PCNT    001004          677#   3623*   3624*   3635
PGE   = 002000          756#   2618
PGETST  013416         2589#
PGTRAP  020522         3400    3410#
PIP   = 020000          761#
PRTP    012426         2390    2425#
PRTP1   012430         2401    2426#
```

DZRSBE.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
PS     = 177776          643* 4003*  644     896*    960*    3402*   3426*   3427    3448*   3449    3471*   3539*   3611*   3617*
PSW    = 177776          644*
PTDONE  026570          4222    4258    4262    4280    4284*
QES     020442          3398*
QESDON  020536          3408    3414*
QQ     = 000001           814*    892*    955*   1005*   1026*   1035*   1064*   1080*   1092*   1101*   1117*   1131*   1138*
                         1154*   1168*   1175*   1188*   1194*   1200*   1207*   1217*   1224*   1232*   1240*   1293*   1309*
                         1321*   1333*   1345*   1372*   1399*   1445*   1480*   1508*   1543*   1574*   1612*   1653*   1704*
                         1745*   1791*   1836*   1878*   1920*   1970*   1994*   2023*   2086*   2150*   2229*   2292*   2314*
                         2322*   2340*   2384*   2433*   2506*   2584*   2626*   2663*   2688*   2712*   2746*   2842*   2858*
                         2889*   2932*   2967*   2999*   3059*   3096*   3120*   3153*   3192*   3228*   3287*   3393*   3416*
                         3439*   3465*   3487*   4061*
RANDOM  026634           1247    4298*
RAND1   026650          4300*   4328
RANEND  027006          4334*
RANNU   001150           771*
RANTS   003742          1245*
RDLIN  = 104412          3852    3933*
RDOCT  = 104410          3932*   4025    4028    4032    4377
RDTST   006376          1709*
RDTSTB  007154          1841*
RMRT1   013616          2631*
RMRT2   013774          2668*
RMRT3   014104          2693*
RMRT4   014214          2717*
RSAS    001122           701*     826     952    1505    1515    1537    1568    1581    1603    1646    2066    2068    2070*
                         2071    2128    2288    2602    2726*   2916    3006    3015*   3016    3053    3077    3591    3607*
                         3989*   3990    4240
RSBA    001112           697*     899*    922     963*    980    1067*   1068    1071*   1072    1075*   1076    1085*   1086
                         1096*   1097*   1098    1281    1286    1335*   1337    1340*   1341    1487*   1502    1519*   1534
                         1550*   1565    1585*   1600    1660*   1666    1693    1711*   1734    1755*   1778    1799*   1830
                         1843*   1866    1887*   1910    1931*   1960    1976*   1983    2002*   2030*   2077    2102*   2132
                         2165*   2199    2214    2238*   2242    2263*   2268    2405*   2444*   2460*   2482    2521*   2537*
                         2559    2591*   2632*   2669*   2694*   2718*   2764*   2771*   2788*   2823    2832*   2849*   2867*
                         2947*   2982*   3024*   3050    3104*   3113    3127*   3161*   3207*   3234*   3249*   3267*   3313*
                         3329*   3353*   3369*   3429*   3452*   3477*   3526*   3558    3951*   3952    4005*   4045*   4050*
                         4076*   4147*   4166*   4245
RSBAB   001146           711*    1336*
RSCS1   001104           694*     898*    917     962*    975    1014*   1015    1018*   1019    1022*   1023    1029*   1030*
                         1031    1299*   1301    1304*   1305    1360    1363*   1364    1489*   1490    1521*   1522    1552*
                         1553    1571    1587*   1588    1609    1624*   1643    1662*   1669*   1670    1678    1713*   1714
                         1722    1757*   1758    1769    1801*   1802    1815    1845*   1846    1854    1889*   1890    1901
                         1942    1979*   2003*   2012    2015*   2039*   2055    2104*   2107    2110    2145    2172*   2175
                         2178    2221    2239*   2240    2264*   2265    2281*   2282    2407*   2408    2418    2446*   2447
                         2463*   2464    2479    2495    2523*   2524    2540*   2541    2556    2572    2593*   2594    2596*
                         2599    2617*   2623    2639*   2652    2659    2671*   2672    2683    2696*   2697    2699*   2708
                         2725*   2739    2743    2766*   2767    2778*   2785    2790*   2791    2799    2833*   2834    2851*
                         2869*   2870    2879    2913    2948*   2957    2983*   2992    3012    3020    3026*   3027    3030
                         3032    3083    3087    3107*   3108    3110    3129*   3132    3134    3150    3163*   3164    3167
                         3169    3186    3208*   3217    3244*   3245    3252*   3253    3277*   3278    3314*   3317    3319
                         3323    3331*   3333    3335    3339    3355*   3356    3358    3361    3370*   3371    3373    3377
                         3403*   3411    3430*   3453*   3460    3478*   3482    3530*   3536*   3542    3579*   3584*   3602
                         3608*   4006*   4007    4009    4046*   4047    4051*   4053    4054    4079*   4080    4150*   4151
                         4153    4169*   4170    4225    4288
RSCS1B  001140           708*    1300*   2919*
```

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RSCS2   001106   695#  820*  824*  835*  897*  904*  909   912*  961*  968*  970*  971   974*
                 1041  1044* 1045  1047  1050* 1051  1054* 1055  1058* 1059* 1060  1063* 1311*
                 1312* 1316  1354  1367  1383  1410  1422  1434  1625  1689  1730  1765  1809
                 1826  1862  1897  1956  1978* 1991  2000* 2008  2016  2120  2193  2206  2249
                 2274  2412  2466  2491  2543  2568  2607  2619  2765* 2783* 2784* 2802  2903*
                 2908  2920  2924  3035  3065* 3067  3090  3102* 3106* 3125* 3131* 3137  3159*
                 3166* 3172  3243* 3251* 3255* 3282  3533* 3535* 3541* 3554  3598* 3982* 3983
                 4038* 4209* 4210* 4233
RSCS2B  001142   709#  1313*
RSDA    001114   698#  900*  928   964*  986   1142* 1143  1146* 1147  1150* 1151  1160* 1161
                 1170* 1171* 1172  1267  1271  1499  1531  1562  1597  1621* 1632  1675  1719
                 1772  1812  1851  1904  1945  2029* 2038* 2138  2188  2359* 2361* 2362  2374
                 2462* 2539* 2640* 2646  2769* 2850* 2854  2868* 2904* 2923  2946* 2981* 3047
                 3198* 3247* 3266* 3328* 3368* 3475* 3528* 3566  3572  3576  3958* 3959  4041*
                 4077* 4084* 4088* 4097* 4106* 4115* 4124* 4133* 4142* 4148* 4167* 4250
RSDB    001126   703#  966*  1353  1378* 1379* 1390  1395  1405* 1418  1430* 1440  1451* 1457*
                 1465  1473  4272
RSDS    001116   699#  913   1525  1591  1684  1821  1951  2040  2044  2050  2052  2074  2117
                 2185  2300  2307  2649  2680  2705  2728  2736  2796  2876  2954  2961  2989
                 2996  3041  3143  3179  3214  3221  3599  3965* 3966  4085  4089  4094  4098
                 4103  4107  4112  4116  4121  4125  4130  4134  4139  4143  4155  4162  4177
                 4260
RSDT    001132   705#  836   840   844   848   850   4267
RSER    001120   700#  821*  901*  934   965*  992   1179* 1180  1183* 1184  1190* 1191  1196*
                 1197  1202* 1203* 1204  1493  1514* 1540  1556  1580* 1606  1622* 1635  1699
                 1987  2114  2142  2182  2224  2253  2257  2278  2285  2299* 2304  2614  2643
                 2656  2674* 2677  2702  2733  2793  2828  2873  2883  2905  2951  2964  2986
                 3005* 3056  3074  3146  3182  3189  3211  3972* 3973  4158  4229
RSLA    001124   702#  2319  2327  2331  2368  3977  4282
RSMR    001130   704#  902*  940   969*  997   1211* 1212  1219* 1220* 1221  1226* 1227  1234*
                 1235  1623* 1638  2033  2349  2353  2366  3066  3073* 3996* 3997  4277
RSMRR   023712   631   3994#
RSREG   026066   3743  4214#
RSVCPS  001136   707#  3401* 3425* 3447* 3474* 3524* 3613  3614*
RSVEC   001134   706#  3400* 3424* 3446* 3472* 3523* 3582* 3613*
RSWC    001110   696#  903*  946   967*  1002  1105* 1106  1109* 1110  1113* 1114  1123* 1124
                 1133* 1134* 1135  1253  1257  1323* 1325  1328* 1329  1488* 1496  1520* 1528
                 1551* 1559  1586* 1594  1620* 1649  1661* 1663  1681  1712* 1725  1756* 1775
                 1800* 1818  1844* 1857  1888* 1907  1932* 1948  1977* 2001* 2031* 2080  2103*
                 2135  2166* 2202  2217  2235* 2260* 2406* 2445* 2461* 2522* 2538* 2592* 2611
                 2633* 2670* 2695* 2719* 2762* 2772* 2789* 2809  2831* 2848* 2866* 2940* 2942*
                 2945* 2975* 2977* 2980* 3025* 3044  3105* 3116  3128* 3162* 3201* 3203* 3206*
                 3237* 3239* 3242* 3250* 3270* 3274* 3276* 3312* 3330* 3354* 3367* 3428* 3451*
                 3476* 3527* 3549  3944* 3945  4004* 4042* 4078* 4149* 4168* 4255
RSWCB   001144   710#  1324*
RSWCWT  006626   1761#
RS04DT  001162   776#  838*  842*  846*  854*  2754  2759  2814  2818  2838  2943  2973  2978
                 3199  3204  3235  3240  3256  3268  3272  3564  3570
RW      = 000006 724#  3305  3306  3307  3308
R0      =%000000 646#  3628* 3812  3831* 4300* 4304* 4309* 4313* 4319* 4321  4322
R1      =%000001 647#  819*  822*  1246* 1403* 1404* 1405  1406  1428* 1429* 1430  1431  1935*
                 1936* 1938* 1939* 2395* 2396* 2397  3261* 3262* 3263* 3813  3823* 3824* 3830*
                 3849  3853* 3866* 3868* 3870* 3873  3876* 4322*
R2      =%000002 648#  2392* 2393  2394* 2398  2400* 2402* 2410* 2426  2428* 2773* 2774  2779
                 3310* 3311* 3327* 3343  3346  3351* 3352* 3365* 3381  3384  3502* 3519* 3529*
                 3535  3588* 3593* 3598  3814  3829* 3850  3856* 3857  3859  3861  3863* 3864*
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                    3865*  3867*  3869*  3875*  4303*  4306*  4312*  4315*  4317*  4318*
R3      =%000003     649#  1250*  1251*  1264*  1265*  1278*  1279*  1933*  1939   2099*  2100   2161*  2163
                    2634*  2635   2720*  2721   2774*  2775*  2776   2779*  2780*  2781   3500*  3520*  3521
                    3531   3537*  3815   3828*  3851   3855*  3874*  4302*  4307*
R4      =%000004     650#  1248*  1254   1255   1258   1260   1262*  1268   1269   1272   1274   1276*  1282
                    1283*  1284   1287   1290   1926*  1927   1929*  1936   2635*  2636*  2637   2721*  2722*
                    2723   3501*  3506   3508*  3519   3648   3658*  3662*  3676*  3767   3770*  3790   3796*
                    3816   3827*  4301*  4305*  4310*  4311*  4314*  4316*  4320*  4325   4326
R5      =%000005     651#  1247*  1253*  1254*  1255   1267*  1268*  1269   1281*  1282*  1284   1934*  1938
                    3514*  3515*  3516*  3533   3649   3650*  3651   3653*  3654   3656   3664   3672*  3673*
                    3674   3675*  3768   3769*  3776*  3778*  3780*  3795*  3817   3826*  3889   3890*  3891
                    3911*  4329*
SAVBAD  001100       689#
SAVEE   001172      782#   3521*  3605*
SC      = 100000     753#
SCOPE   = 104400     817    895    958   1008   1026   1038   1064   1080   1092   1101   1117   1131   1138
                    1154   1168   1175   1188   1194   1200   1207   1217   1224   1232   1243   1296   1309
                    1321   1333   1348   1375   1399   1445   1483   1511   1546   1577   1615   1656   1707
                    1748   1794   1839   1881   1923   1973   1997   2026   2089   2153   2232   2295   2317
                    2322   2343   2387   2436   2509   2587   2629   2666   2691   2715   2749   2845   2861
                    2892   2935   2970   3002   3062   3099   3123   3156   3195   3231   3290   3396   3419
                    3442   3468   3490   3615   3622   3928#  4064   4204   4205
SECT    017332      3232#
SEEC    026422      4236   4263#
SETPAT  016504      3101#
SHIFT   026666      4304#  4308
SILO    004632      1402#
SILOB   004422      1352#
SILOFL  005004      1448#
SP      =%000006     652#   798*  3390*  3399*  3421*  3444*  3470*  3583*  3609*  3612*  3818   3822*  3942*
                    3949*  3956*  3963*  3970*  3980*  3987*  3994*  4001*  4022*  4294*  4338*  4339*  4344
                    4352   4353   4378
SRAS    023666       630   3987#
SRCS2   023642       629   3980#
SRSBA   023512       624   3949#
SRSCS1  023736       632   4001#
SRSDA   023536       625   3956#
SRSDS   023562       626   3963#
SRSER   023606       627   3970#
SRSLA   023632       628   3977#  3978
SRSWC   023466       623   3942#
SRO     = 177572     715#  3297   3309*  3387*
STRT    000230       611    617#
STTEST  001432       830    833#   869
SUSWR   = 104420     812   3936#  4035
SWI     027124      4034*  4336   4354*  4357#
SWR     001026       685#   829    855    875   1807   3625   3686   3688   3690   3701   3730   3734   3744
                    3747   3944   3951   3958   3965   3972   3982   3989   3996   4006   4036   4039   4043
                    4058   4068   4073   4184   4197   4341   4345*  4347   4363
SWRCHG  024320      4049   4053#
SWREG   000176       608#  4068   4345   4347   4363   4374   4381*
SW10    = 002000     596#  3625   3729   3730
SW11    = 004000     595#  3701
SW12    = 010000     594#  3626   3628
SW13    = 020000     593#  3734
SW14    = 040000     592#  3690
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SW15  = 100000          591#
SW8   = 000400          599#   3685    3686
SW9   = 001000          598#   3747
TIMES   022414           890    891*   1013*   2096   2097*   2297*   2345   2346*   2389*   3293   3294*   3422*   3497
                        3498*  3616*   3705    3720#
TIMSV   001164           777#   890*   1013    2096*  2297    2345*   2389   3293*   3422   3497*   3616
TKB     001022           683#   4367
TKKS    024232          4041#
TKS     001020           682#   4365
TKSEL   024014           811    4022#
TK1     024200          4036#   4059
TK2     024206          4037#   4060
TMEOUT  012234          2365    2381#
TPB     001024           684#   3659*   3664*
TPS     001016           681#   3660    3665
TRE   = 040000           752#   1363    2015    2617    3579
TRY     001326           821#    825
TRYNX   001634           834     853     866#   3619
TSTAGN  012266          2393#   2429
TSTNEM  010120          2006#
TSTVEC  021340          3523    3541#
TST1    001314           817#
TST10   003050          1080#
TST100  015052          2845#
TST101  015126          2861#
TST102  015242          2892#
TST103  015512          2935#
TST104  015670          2970#
TST105  016034          3002#
TST106  016330          3062#
TST107  016502          3099#
TST11   003102          1092#
TST110  016616          3123#
TST111  016770          3156#
TST112  017164          3195#
TST113  017330          3231#
TST114  017674          3290#
TST115  020440          3396#
TST116  020536          3419#
TST117  020642          3442#
TST12   003126          1101#
TST120  020760          3468#
TST121  021066          3490#
TST122  024352          4064#
TST13   003210          1117#
TST14   003242          1131#
TST15   003266          1138#
TST16   003350          1154#
TST17   003402          1168#
TST2    002052           895#
TST20   003426          1175#
TST21   003470          1188#
TST22   003512          1194#
TST23   003534          1200#
TST24   003560          1207#
TST25   003616          1217#
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TST26	003644	1224#												
TST27	003702	1232#												
TST3	002274	958#												
TST30	003740	1243#												
TST31	004160	1296#												
TST32	004232	1309#												
TST33	004276	1321#												
TST34	004346	1333#												
TST35	004420	1348#												
TST36	004522	1375#												
TST37	004630	1399#												
TST4	002506	1008#												
TST40	005002	1445#												
TST41	005116	1483#												
TST42	005242	1511#												
TST43	005422	1546#												
TST44	005560	1577#												
TST45	005752	1615#												
TST46	006146	1656#												
TST47	006374	1707#												
TST5	002600	1026#												
TST50	006562	1748#												
TST51	006734	1794#												
TST52	007152	1839#												
TST53	007346	1881#												
TST54	007542	1923#												
TST55	007732	1973#												
TST56	010056	1997#												
TST57	010204	2026#												
TST6	002626	1038#												
TST60	010504	2089#												
TST61	010762	2153#												
TST62	011332	2232#												
TST63	011644	2295#												
TST64	011722	2317#												
TST65	011736	2322#												
TST66	012046	2343#												
TST67	012236	2387#												
TST7	002766	1064#												
TST70	012460	2436#												
TST71	013022	2509#												
TST72	013414	2587#												
TST73	013614	2629#												
TST74	013772	2666#												
TST75	014102	2691#												
TST76	014212	2715#												
TST77	014362	2749#												
TTAGG	002276	960#												
TTMOUT	010502	2049	2084#											
TTVEC	021570	3582	3588#											
TYPE = 104402		831	859	863	879	880	2337	2930	3627	3732	3736	3742	3794	3834
		3880	3899	3904	3907	3910	3929#	4024	4027	4031	4067	4082	4092	4101
		4110	4119	4128	4137	4175	4201	4216	4219	4224	4228	4232	4239	4244
		4249	4254	4259	4266	4271	4276	4281	4371	4373	4376			
TYPE0 = 104404		3741	3930#	4218	4221	4226	4230	4234	4241	4246	4251	4256	4261	4268
		4273	4278	4283	4375									

DZRSBE.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

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TYPES = 104406          862    878   3931#
UNCMP   001156          774#   827*   833    852    866*   873*  1505  1515  1537  1568  1581  1603  1646
                       2126   3007   3015   3053   3078
UNITST  007544         1925#
UNITSV  001154          773#   826*   833    852*  2897   3504
UNNUM   001152          772#   828*   835    861    868*   874*   877   897   912   961   974  1063  1311
                       1314   1356   1382   1409   1627   1687  1728  1763  1824  1860  1895  1927  1934
                       1954   2006   2017   2058   2121   2194  2207  2247  2272  2414  2467  2489  2544
                       2566   2605   2784   2803   3037   3069  3091  3139  3174  3280  3506  3514  3541
                       3552   4026*  4073*  4210
UP      = 000000        725#   3305   3306   3307   3308
WAITRY  026600         1673   1717   1761   1805   1849   1893  1940  1980  2004  2597  2641  2675  2700
                       2852   2949   2984   3209   3431   3479  4287#
WC      = 000010        740#    948   1004   1108   1112   1116  1137  1327  1331  1498  1530  1561  1596
                       1651   1665   1683   1727   1777   1820  1859  1909  1950  2082  2137  2204  2219
                       2613   3046   3118   3551   4056   4252
WCE     = 040000        758#
WCEDNB  013356         2536   2578#
WCEDNE  012772         2459   2501#
WCEDON  013014         2454   2505#
WCEDOS  013400         2517   2531   2582#
WCETB   013054         2521#  2581
WCETSB  013024         2515#
WCETST  012462         2442#
WCETT   012470         2444#  2504
WORK    001174          794#  1212*  1213*  1214   1227*  1228*  1229  1235*  1236*  1237  1245*  1380*  1386*
                       1638*  1639*  1640   1797*  1798*  1842*  1872*  1873  1885*  1886*  2033*  2035*  2058*
                       2062   2064*  2162*  2171*  2191   2212*  2213*  2214  2236*  2237*  2238   2261*  2262*
                       2263   2326*  2329*  2360*  2364*  2395   2405   2411*  2727*  2730*  2895*  2897   2900*
                       2923*  3258*  3260*  3264*  3404*  3405*  3454*  3455*  3503*  3504   3510*  3590*  3591
                       3595*  3607   4029*  4030*  4042   4287*  4290*  4291  4323*  4327*
WORK1   001176          795#  2167*  2168*  2169   2370*  2372*  3499*  3512  3518*  3580   4039*  4040*  4041
WORK2   001200          796#  2756*  2758*  2761*  2762   2789   4036*  4058
WRCKT   006564         1753#
WRCKTB  007350         1884#
WRTLCK  024354          614   4066#
WRTST   006150         1658#
WRTSTB  006736         1796#  4192
WT      024272         4047#  4052
WTDV    021336         3540#
WTDV1   021706         3581   3606   3611#
WTDV2   021566         3583   3586#  3609
WTE     024302         4044   4050#
WWP     = 000004        779#  2394
XXX     027114         4337   4354#
ZERONE  004524         1377#
$ENDAD  022026          602   3631#
$END1   022036         3629   3633#
.       = 030764        600#   601#   603#   606#   610#   613#  616#  622#  634#  673#  688#   810   831
                        859    880   881#   910    914    918   923   929   935   941   947   953   972
                        976    981   987    993    998   1003  1016  1020  1024  1032  1042  1052  1056
                       1061   1069  1073   1077   1088   1099  1107  1111  1115  1126  1136  1144  1148
                       1152   1163  1173   1161   1185   1192  1198  1205  1215  1222  1230  1238  1302
                       1306   1318  1326   1330   1338   1342  1358  1361  1365  1370  1392  1397  1412
                       1423   1432  1435   1443   1453   1467  1470  1475  1491  1494  1497  1500  1503
                       1506   1516  1523   1526   1529   1532  1535  1538  1541  1554  1557  1560  1563
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		1566	1569	1572	1582	1589	1592	1595	1598	1601	1604	1607	1610	1630
		1633	1636	1641	1644	1647	1650	1664	1667	1671	1676	1679	1682	1685
		1691	1697	1700	1715	1720	1723	1726	1732	1738	1743	1759	1767	1770
		1773	1776	1782	1803	1813	1819	1822	1828	1834	1847	1852	1858	1864
		1870	1876	1891	1899	1905	1908	1914	1943	1946	1949	1952	1958	1964
		1985	1988	1992	2010	2013	2020	2045	2053	2056	2072	2075	2078	2081
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		4260#	4266	4267#	4271	4272#	4276	4277#	4281	4282#	4371	4372#	4373	4376
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.CNTLU	027210	3937	4372#											
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		4279												
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.MSG	027274	4367#	4368#	4369	4378#	4381	4384#							
.OVER	022372	3689	3714#											
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.RDOC.	023126	3847#	3932											
.SAVR6	023120	3818#	3822	3840#										
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.SUSWR	027006	3936	4336#											
.SVLAD	022346	3697	3702	3708#	3716									
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		3628	3685	3729	3734	3747								
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.TYPES  022576          3764#   3931
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DZRSBE.P11 CROSS REFERENCE TABLE -- MACRO NAMES

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      1345  1372  1399  1445  1480  1508  1543  1574  1612  1653  1704  1745  1791  1836  1878
      1920  1970  1994  2023  2086  2150  2229  2292  2314  2322  2340  2394  2433  2506  2584
      2626  2663  2688  2712  2746  2842  2858  2889  2932  2967  2999  3059  3096  3120  3153
      3192  3228  3287  3393  3416  3439  3465  3487  4061
ODT11    1#
ODT11X   1#
POP      1#   670#  3696  3699  3795  3826  3874
PRINT    1#   670#   831   859   880  2337  2930  3627  3736  3742  3834  3879  3899  3903  4024
      4027  4031  4067  4082  4092  4101  4110  4119  4128  4137  4175  4201  4216  4219  4224
      4228  4232  4239  4244  4249  4254  4259  4266  4271  4276  4281  4371  4373  4376
PUSH     1#   670#  3693  3766  3812  3849
SCOPE.   1#   814#   892#   955#  1005#  1026#  1035#  1064#  1080#  1092#  1101#  1117#  1131#  1138#  1154#
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      2663#  2688#  2712#  2746#  2842#  2858#  2889#  2932#  2967#  2999#  3059#  3096#  3120#  3153#  3192#
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SET    3915#  3928  3929  3930  3931  3932  3933  3934  3935  3936  3937
TYPADR   1#
TYPBIT   1#   670#
TYPCHR   1#   670#
TYPDEC   1#   670#
TYPLIN   1#   670#
TYPOCS   1#   670#   860   877
TYPOCT   1#   670#  3740  4217  4220  4225  4229  4233  4240  4245  4250  4255  4260  4267  4272
      4277  4282  4374
TYPTXT   1#   670#   831   859   880  2336  2930  4024  4027  4031  4066  4082  4092  4101  4110
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DZRSBE.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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ASL      866  4304
BCC     1091  1129  1166  2454  2531  3511  3596
BCS      867  1453  1459  1470  1479  2459  2536  2901
BEQ      810   823   834   849   851   858   910   914   918   923   929   935   941   947   953
         972   976   981   987   993   998  1003  1016  1020  1024  1032  1042  1046  1052  1056
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BIC      617   807   832   852   864  1213  1228  1236  1283  1368  1626  1639  2105  2127  2168
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BISB    3787
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BLT     3862
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DZRSBE.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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	3357	3359	3372	3374	3661	3666	3745	3894	4010	4048	4055	4081	4152	4154	4171
	4366														
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CLC	1084	1122	1159	1449	1463	2452	2529	3509	3589	3594					
CLR	805	806	820	842	846	874	1030	1059	1097	1134	1171	1203	1220	1378	1389
	1403	1414	1428	1710	1842	1926	2032	2038	2059	2162	2400	2410	2411	2432	2443
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	3823	3853	3854	4075	4165	4189	4195	4287	4303						
CLRB	1313	3749	3771	3773	3793										
CMP	836	840	844	848	850	909	913	917	946	971	1002	1015	1019	1023	1031
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CMPB	3656	3688	3705	3857	3859	3861	3897	3901	3908	4369					
COM	4030														
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EMT	642														
HALT	601	881	3746	3820	3837	4070	4083	4093	4102	4111	4120	4129	4138	4176	
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RESET           905  1040  3630

ROL            1090  1128  1165  1452  1458  1469  1478  2061  2453  2458  2530  2535  2900  3510  3595
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DZRSBE.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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RTS     4285  4295  4329
SEC     1456  1477  2060  2457  2534
SUB     3738  3923
TRAP    3925  3928  3929  3930  3931  3932  3933  3934  3935  3936  3937
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RUN-TIME RATIO: 204/82=2.4
CORE USED: 23K (45 PAGES)

Spooler runtime 18 Seconds, 77 KCS, 493 disk reads, 3 disk writes, 128 pages