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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZRCB-B-D  
REPLACES: MAINDEC-11-DSJA  
PRODUCT NAME: RC11 DISK DATA  
DATE CREATED: APRIL-1973  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: BOB BRAIN/STANLEY HARACKIEWICZ

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DIGITAL EQUIPMENT CORPORATION  
MAYNARD, MASS.

MAINDEC-11-DZRCB-B  
DZRCBB.P11

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DESCRIPTION

RC11 DATA TEST

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1. ABSTRACT

THE RC11 DISK DATA TEST IS A SERIES OF ADDRESS AND DATA RELIABILITY ROUTINES WHICH VERIFY TO THE USER THE DISK CONTROL (RC11) AND DISK (RS64) ARE OPERATING CORRECTLY. THIS TEST USED IN CONJUNCTION WITH THE RC11 DISKLESS AND RC11 MULTI DISK ASSURES THE USER OF AN ERROR FREE SYSTEM, WHEN USED IN ITS ENTIRETY.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 WITH RC11 AND RS64.

2.2 STORAGE

DATA TEST

MAIN BODY OF PROGRAM OCCUPIES FROM LOC 0 TO 10500. THE REST OF THE AVAILABLE CORE IS DIVIDED INTO 2 BUFFERS. THE FIRST IS THE WRITE BUFFER AND THE SECOND IS THE READ BUFFER.

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3. LOADING PROCEDURE

3.1 METHOD OF LOADING

PROGRAM FORMAT ABSOLUTE

A. VERIFY THE BOOT LOADER IS IN MEMORY.

B. SET SWITCH REGISTER EQUAL TO \*500

MEMORY SIZE \*

|     |     |
|-----|-----|
| 4K  | 17  |
| 8K  | 37  |
| 12K | 57  |
| 16K | 77  |
| 20K | 117 |
| 24K | 137 |
| 28K | 157 |

C. DEPRESS LOAD ADDRESS.

D. DEPRESS START.

4. STARTING PROCEDURE

4.1 WORST CASE DISK TEST UNIT ZERO

- A) SET SWITCH REGISTER EQUAL TO 200
- B) DEPRESS LOAD ADDRESS
- C) SET SWITCH REGISTER EQUAL TO ZERO
- D) DEPRESS START

4.2 OPERATOR INTERVENTION FOR DATA TEST ONLY.

- A) SET SWITCH REGISTER EQUAL TO 200
- B) DEPRESS LOAD ADDRESS
- C) SET SWITCH REGISTER EQUAL TO MODE OF OPERATION  
(REF. SEC 5.)
- D) DEPRESS START.

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5. OPERATING PROCEDURE

5.1 CONTROL SWITCH SETTINGS

|      |   |  |
|------|---|--|
| SW15 | 1 | ENTER PROGRAM CONVERSATION MODE                            |
|      | 0 | REF. SEC. 5.2<br>OPERATE WORST CASE DISK ZERO              |
| SW14 | 1 | DELETE TYPEOUTS  |
|      | 0 | REPORT MESSAGE   |
| SW13 | 1 | HALT ON FLAG (READY)                                       |
|      | 0 | EXECUTE NEXT OPERATION                                     |
| SW12 | 1 | DELETE DATA COMPARISONS                                    |
|      | 0 | COMPARE DATA BUFFERS                                       |
| SW11 | 1 | LOOP ON TEST   |
|      | 0 | CONTINUE TO NEXT TEST                                      |
| SW10 | 1 | HALT AFTER ERROR REPORT                                    |
|      | 0 | CONTINUE AFTER ERROR REPORT                                |
| SW9  | 1 | WAIT FOR INTERRUPTS USING WAIT                             |
|      | 0 | INSTRUCTION<br>WAIT FOR INTERRUPTS WITH BACKGROUND<br>TEST |
| SW8  | 1 | LOOP ON DISK ADDRESS (SPECIFIED BY                         |
|      | 0 | WORD COUNT AND DAR)<br>CONTINUE TO NEXT DISK BUFFER AREA.  |
| SW5  | 1 | SELECT TRACK FROM SW (SEE NOTE 5.1.1)                      |
|      | 0 | SELECT TRACK UNDER PROGRAM CONTROL                         |

TRACK SELECTION

4      3      2      1      0

SELECT ONE OF 37(8) TRACKS

5.1.1 ROUTINE TO SETUP CYLINDER NUMBER FROM SWR

WHEN USING THIS OPTION, CARE MUST BE TAKEN IN THAT WHEN  
ACCESSING TRACK ADDRESS 37, THE STANDARD WORK COUNT (SWRDCY)  
SHOULD NOT EXCEED 4000 (8) FOR A NON-EXISTANT DRIVE ERROR  
WILL OCCUR.

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RC11 DATA TEST

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5.2 CONVERSATION MODE FOR PROGRAM PARAMETERS FOR DATA TEST ONLY  
IN THE PROGRAM CONVERSATION MODE THE OPERATOR CAN SPECIFY ANY ONE OR ALL OF THE PROGRAM PARAMETERS.

PROGRAM CONVERSATION

DATA TEST ONLY?(YES-NO)

IF THE OPERATOR ANSWER YES THE PROGRAM WILL ENTER ONLY THE DATA PORTION OF TEST.

MULTI DRIVE MODE? (YES-NO)

MULTI DISK MODE IS A MODE IN THE PROGRAM WHICH ALLOWS THE OPERATOR TO EXECISE ALL THE DISKS ON THE SYSTEM WITHOUT RE-STARTING THE PROGRAM. THE PROGRAM AFTER EXERCISING ONE DISK WILL REPORT A MESSAGE TELLING THE OPERATOR WHICH DISK WILL BE SELECTED NEXT, AND THEN THE PROGRAM WILL EXERCISE THAT DISK. WHEN A COMPLETE PASS IS ACCOMPLISHED. A PASS COMPLETE WILL BE REPORTED AND THE TEST WILL RECYCLE.

IF THE OPERATOR ANSERS "YES" TO THIS QUESTION, HE WILL THEN BE ASKED HOW MANY DISKS ARE ON THE SYSTEM, AND THEN THE PRECEDING QUESTION WILL BE SKIPPED. IF THE OPERATOR ANSERS "NO" TO THIS QUESTION, THE NEXT QUESTION WILL BE SKIPPED, AND HE WILL THEN BE ASKED WHICH DISK IS TO BE EXERCISED.

NUMBER OF DRIVES(1 - 4)?

TYPE THE NUMBER OF DISKS ON THE SYSTEM, FOR MULTI DISK MODE.

EXERCISE DRIVE?

WHEN NOT IN THE MULTI DISK MODE THE OPERATOR WILL HAVE TO SPECIFY WHAT DISK IS TO BE USED.

OPTIONAL WORD COUNT(YES-NO)

IF THE OPERATOR ANSWERS "NO" TO THIS QUESTION THE NEXT TWO QUESTIONS WILL BE DELETED FROM THE CONVERSATION.

LENGTH (1 TO N)?

THE OPERATOR CAN SPECIFY ANY LENGTH TRANSFER FROM 1(8) TO N(8) WORDS. THE NORMAL TRANSFER LENGTH IS N(8) WORDS WHERE N IS THE MAXIMUM BUFFER SIZE FOR THE AVAILABLE CORE.

STARTING SECTOR?

THE OPERATOR CAN SPECIFY THE STARTING SECTOR (0-77). THIS

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RC11 DATA TEST REPLACES DSJA-PB2/DZRCB-A

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SHOULD BE USED IN CONJUNCTION WITH SWITCHES 8 AND 0-5.

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RC11 DATA TEST

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DATA PATTERN NO. ?

IF NO OPTIONAL DATA PATTERN IS REQUESTED (#22) THE PROGRAM  
WILL EXECUTE THE FOLLOWING LIST OF DATA PATTERNS.

|         |   |
|---------|---|
| PATTERN | 0 = 000000  |
| "       | 1 = 177777  |
| "       | 2 = 134510  |
| "       | 3 = 043267  |
| "       | 4 = 100000  |
| "       | 5 = 107070  |
| "       | 6 = 070707  |
| "       | 7 = 125252  |
| "       | 10 = 052525   |
| "       | 11 = 177737   |
| "       | 12 = 004102   |
| "       | 13 = 136363   |
| "       | 14 = 063636   |
| "       | 15 = 000001   |
| "       | 16 = 100005   |
| "       | 17 = 000520   |
| "       | 20 = 030303   |
| "       | 21 = RANDOM DATA                                    |
| "       | 22 = RUN ALL DATA PATTERNS UNDER<br>PROGRAM CONTROL |

IN THIS SECTION OF THE PROGRAM PARAMETER CONVERSATION MODE,  
THE OPERATOR CAN SELECT ANY ONE OR ALL THREE OF THE CONTROL  
FUNCTIONS TO BE EXECUTED. THE NORMAL SEQUENCE OF DISK  
FUNCTIONS UNDER PROGRAM CONTROL IS WRITE, WRITE CHECK, AND  
THEN READ. BY ENTERING THE CONVERSATION MODE THE OPERATOR  
HAS GAINED COMPLETE CONTROL OVER THE DISK FUNCTIONS. HE  
MUST SPECIFY YES OR NO TO ALL OF THE FOLLOWING QUESTIONS.

WRITE? (YES - NO)  
WRITE CHECK? (YES - NO)  
READ? (YES - NO)

TO PERFORM A WRITE CHECK ONLY, THE OPERATOR MUST FIRST WRITE  
SOME KNOW DATA ON THE DISK. THIS COURSE OF ACTION ALSO  
PREVAILS FOR A READ ONLY OPERATION.  
\* IF AND ERROR OCCURS IN THE LINE THE OPERATOR IS TYPING,  
DEPRESS THE RUB-OUT. THIS CAUSES THE QUESTION TO BE RETYPED  
AND ALLOWS THE OPERATOR TO PROPERLY ANSWER THE QUESTION.

\* INDICATES TO THE OPERATOR THAT A CARRIAGE-RETURN SHOULD  
BE TYPED AT THE INDICATED PLACE TO TERMINATE THE LINE  
OF TYPED CHARACTERS.

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5.3 ROUTINE ABSTRACTS

ADDRESS TEST

RANEX - RANDOM DATA, RANDOM ADDRESS RANDOM WORD COUNT TEST

THIS ROUTINE TESTS THE ABILITY OF THE SYSTEM TO ACCESS RANDOM ADDRESS WITH RANDOM DATA AND AN INCREMENTAL WORD COUNT. THE DATA IS FIRST WRITTEN ON THE DISK AND THEN DATA IS WRITE-CHECKED. ALL ERRORS ARE REPORTED. THE WORD COUNT RUNS FROM 1 TO N(8) WORDS. WHERE N IS DESCRIBED IN 5.2.

DATA RELIABILITY - DATA PATTERN TEST

IN THIS PORTION OF THE TEST, THE ABILITY OF THE COMPLETE DISK SURFACE TO WRITE, WRITE CHECK, AND READ DATA IS TESTED. THE ROUTINE FIRST WRITES THE COMPLETE SURFACE WITH A SET DATA PATTERN, THEN A WRITE CHECK OF THE COMPLETE SURFACE IS ACCOMPLISHED, THUS REPORTING ALL ERRORS BETWEEN THE DATA WRITTEN AND THE DATA IN MEMORY. THREE READS ARE ACCOMPLISHED FOR EACH BUFFER AREA ON THE DISK. THE OPERATOR AT THIS POINT HAS SEVERAL OPTIONS AS TO WHAT COURSE OF ACTION THE PROGRAM WILL TAKE NEXT, (REF. SEC. 5.1)

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RC11 DATA TEST

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\*\*\*ROUTINES IN DATA TEST\*\*\*

|     |     |       |  |
|-----|-----|-------|--|
| 600 | JMP | ADT1  | TRACK AND SECTOR SELECT TEST                               |
| 604 | JMP | ADT3  | WRITE EACH WORD ADDR ON ITSELF<br>AND READ BACK TO COMPARE |
| 610 | JMP | RANEX | RANDOM ADDRESS, DATA AND WORD<br>COUNT TEST                |
| 614 | JMP | TKSEL | ONE WORD READ TEST TO SELECTED<br>TRACK                    |

\*\*\*POWER FAIL ROUTINES\*\*\* \*\*\*DATA TEST ONLY\*\*\*

|     |     |      |                                     |
|-----|-----|------|-------------------------------------|
| 650 | JMP | PFT1 | DISK WRITE POWER FAIL TEST          |
| 654 | JMP | PFT2 | DISK WRITE CHECK POWER FAIL<br>TEST |

6. ERROR REPORTS

6.1 STATIC AND ADDRESS REPORT.

|       |     |        |        |
|-------|-----|--------|--------|
| ERROR | XXX | XXXXXX | XXXXXX |
|       | A   | B      | C      |

A= IS THE TAG FOR THE LISTING  
 B= WHAT WAS EXPECTED (WORK1) OPTIONAL  
 C= WHAT WAS RECEIVED (WORK)

WHEN A REPORT ONLY CONTAINS ONE WORD THE PROGRAM WAS EXPECTING ZEROS BUT RECEIVED WHAT WAS REPORTED.

6.2 ERROR REPORTS

STATUS ERROR

|              |        |      |        |      |        |      |
|--------------|--------|------|--------|------|--------|------|
| STATUS ERROR | XXXXXX | RCER | XXXXXX | RCDA | XXXXXX | RCCS |
|              | A      |      | B      |      | C      |      |

A= DISK ERROR REGISTER  
 B= DISK ADDRESS REGISTER  
 C= DISK CONTROL REGISTER

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RC11 DATA TEST

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BIT LAYOUT OF DATA REGISTER

- BIT15= ERROR
- BIT14= DATA ERROR
- BIT13= ADDRESS ERROR
- BIT12= WRITE LOCK ERROR
- BIT11= NON-EXISTENT DISK
- BIT10= WRITE CHECK ERROR
- BIT9= INHIBIT INCREMENTING CA
- BIT8= ABORT
- BIT7= READY
- BIT6= INTERRUPT ENABLE
- BIT5= EXTENDED MEMORY 1 (XM1)
- BIT4= EXTENDED MEMORY 0 (XM0)
- BIT3= MAINTENANCE
- BIT2-1= FUNCTION REGISTER

BIT 2  
0  
1  
0  
1

BIT 1 OPERATION  
0 LOOK AHEAD  
0 READ  
1 WRITE  
1 WRITE CHECK

BIT0= GO (WRITE ONLY BIT).

NOTE: IF AN ERROR OCCURS, THE FOLLOWING INFORMATION IS AVAILABLE TO THE USER IN THE DAE:

- BIT4= ADDRESS NOT FOUND
- BIT5= DISK OVERFLOW
- BIT6= ADDRESS SYNC. ERROR
- BIT7= ADDRESS PARITY ERROR
- BIT8= B TRACK ERROR
- BIT9= A TRACK ERROR
- BIT12= NONEXISTENT MEMORY
- BIT13= DATA SYNC. ERROR
- BIT14= BLOCK CHECK ERROR
- BIT15= DATA LATE

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RC11 DATA TEST

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6.3 DATA ERRORS

DATA ERROR XXX READ XXXXXX RCDA XX WORD ADR. XXXXXX XXXXXX  
                  A                  B                  C                  D                  E

A= WHICH READ THE ERROR OCCURRED  
B= THE DISK ADDRESS REGISTER  
C= WORD ADDRESS (0-37)  
D= THE DATA WRITTEN ON THE DISK  
E= THE DATA READ FROM THE DISK

6.4 RANEX ERRORS

ERRORS WHICH OCCUR IN RANEX ALSO HAVE THE WORD COUNT REPORT WITH THE ERROR MESSAGE IN THE FOLLOWING MANNER.

RANEX ERROR XXXXXX RCDA XXXXXX WORD COUNT.  
                  A                  B

A= STARTING DAR OF TRANSFER  
B= WORD COUNT OF TRANSFER

6.5 DISK ADDRESS ERROR

DRIVE ADDRESS ERROR XXXXXX DMA XXXXXX RCDA  
                                  A                  B

A= TRUE DISK ADDRESS  
B= DISK ADDRESS FOUND

THE TERMINATING DISK ADDRESS AFTER THE TRANSFER WAS NOT CORRECT. THE RCDA SHOULD EQUAL WHAT WAS REPORTED.

6.6 PROCESSOR TIME OUT

PROCESSOR BACKGROUND TIMED OUT

THIS MESSAGE WILL BE REPORTED IF THE DISK FAILS TO RAISE A BR REQUEST AFTER EXTENDED PERIOD OF TIME.

6.7 END

END

THIS MESSAGE IS REPORTED AT THE END OF ONE COMPLETE PASS OF THE DISK SYSTEM.

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6.8 PARITY

THIS MESSAGE IS REPORTED IF THE PROGRAM DETECTS A MEMORY PARITY ERROR DURING EXECUTION.

7. MISCELLANEOUS

IN SOME ADDRESS TESTS THE PROGRAM DEPENDS ON WRITTING AND READING DATA CORRECTLY FROM THE DISK, AND IF IT DOES NOT IT MAY REPORT AN ADDRESS FAILURE, WHEN IN FACT IT WAS A DATA FAILURE.

7.1 SUGGESTED POWER FAIL TEST

THIS TEST IS SUGGESTED SO THAT THE ABILITY OF THE DISK TO RETAIN DATA AFTER A POWER FAILURE HAS OCCURRED MAY BE TESTED.

FOLLOW THESE STEPS IF NO ERROR OCCURS, ONE PASS SHOULD BE SUFFICIENT:

- A) RUN TEST FROM 200 FOR 1 PASS.
- B) LOAD AND START PFT1
- C) UPON RECEIVING "OK" FROM THE PROGRAM TURN OFF THE POWER TO THE MACHINE AND THEN BACK ON AGAIN.
- D) THERE SHOULD BE ATMOST ONE ERROR. ANY MORE IS CONSIDERED UNRELIABLE.
- E) PERFORM THE SAME STEPS WITH PFT2. THIS TIME THERE SHOULD BE NO ERRORS.

8. RUNTIME

8.1 TYPEOUT WILL OCCUR WITHIN 15 MIN. WITH BK OF MEMORY.

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:PROGRAM BY BOB BRAIN/C. CASWELL

.REM\*

| SWITCH | REASON                  |
|--------|-------------------------|
| 15     | ENTER CONVERSATION MODE |
| 14     | INHIBIT TYPEOUTS        |
| 13     | HALT ON COMPLETION      |
| 12     | INHIBIT COMPARISON      |
| 11     | LOOP ON TEST            |
| 10     | HALT ON ERROR           |
| 9      | BACKGROUND TEST         |
| 8      | LOOP ON DISK ADDRESS    |
| 5      | SELECT TRACK NUMBER     |
| 4 - 0  | TRACKS 0 - 37*          |

```
.ENABL ABS
N= 1
BIT0=1
BIT1=2
BIT2=4
BIT3=10
BIT4=20
BIT5=40
BIT6=100
BIT7=200
BIT8=400
BIT9=1000
BIT10=2000
BIT11=4000
BIT12=10000
BIT13=20000
BIT14=40000
BIT15=100000

WRITE=TRAP+3
WRCHECK=TRAP+7
READ=TRAP+5
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000001
000001
000002
000004
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000020
000040
000100
000200
000400
001000
002000
004000
010000
020000
040000
100000

104403
104407
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593      000008      . =      0      ;TRAP CATCHER 0 - 776
594      000200      . =      200
595      000200      JMP      START
596      000167      . =600
597      000600      JMP      ADT1      ;TRACK AND SECTOR SELECT TEST
598      000167      JMP      ADT3      ;WRITE EACH WORD ADDR ON ITSELF AND
599      000167      ;READ BACK TO COMPARE
600
601      000610      JMP      RANEX      ;RANDOM ADDRESS, DATA AND
602      000167      ;WORD COUNT TEST
603      000614      JMP      TKSEL      ;ENABLES OPERATOR TO SELECT TRACKS DYNAMICLY
604
605      000650      . =650
606      000167      JMP      PFT1      ;DISK WRITE POWER FAIL TEST
607      000167      JMP      PFT2      ;DISK WRITE CHECK POWER FAIL TEST
608
609      ;RC11 DATA TEST
610      ;VECTORS USED IN PROGRAM
611      ;#1 LOC 210 DISK INTERRUPT
612      ;#2 LOC 30 EMT (TELETYPE OUTPUT)
613      ;#3 LOC 34 TRAP (DISK HANDLERS)
614      ;#4 LOC 14 TRACE TRAP (USED IN BACKGROUND TEST)
615      ;#5 LOC 20 IOT TRAP (USED IN CALLING BACKGROUND TEST)
616
617      001000      . =      1000

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620 001000 177570  
621 001002 177776  
622 001004 177566  
623 001006 177562  
624 001010 177564  
625 001012 177560  
626 001014 033604  
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630 001016 177440  
631 001020 177444  
632 001022 177446  
633 001024 177450  
634 001026 177452  
635 001030 177442  
636 001032 177454  
637 001034 177456  
638  
639 001036 000210  
640 001040 000212  
641 001042 000200  
642  
643  
644  
645 001044 000000  
646 001046 146723  
647 001050 000000  
648 001052 000000  
649 001054 000000  
650 001056 000000  
651 001060 000000  
652 001062 000000  
653 001064 000000  
654 001066 000000  
655 001070 000000  
656 001072 000000  
657 001074 000000  
658 001076 000000  
659 001100 000000  
660 001102 000000  
661 001104 000000  
662 001106 000000  
663 001110 000000  
664  
665  
666  
667 001112 000000  
668 001114 000000  
669 001116 000000  
670 001120 000000

;I/O ADDRESS POINTERS

SWR: 177570  
PS: 177776  
TPB: 177566  
TKB: 177562  
TPS: 177564  
TKS: 177560  
ODT: 33604

; SWITCH REGISTER  
; PROCESSOR STATUS REGISTER  
; TELETYPE REGISTERS

;DISK I/O REGISTERS

RCLA: 177440  
RCER: 177444  
RCCS: 177446  
RCWC: 177450  
RCBA: 177452  
RCDA: 177442  
RCMR: 177454  
RCDB: 177456

; LOOK AHEAD  
; DSK STATUS 2  
; DSK STATUS 1  
; WORD COUNT  
; CURRENT TRANSFER ADDRESS  
; DSK ADDRESS  
; MAINTENANCE  
; DATA BUFFER

VECTOR: 210  
STATUS: 212  
PRIORITY: BIT7

; INTERRUPT VECTOR ADDRESS  
; DISK INTERRUPT STATUS  
; DISK PRIORITY LEVEL

;RC11 DEDICATE REGISTERS (MEMORY)

FLAG: 0  
RANNU: 146723  
WRDCT: 0  
TRACK: 0  
DMA: 0  
PATNU: 0  
BUF: 0  
TWRDCT: 0  
TDMA: 0  
SWRDCT: 0  
ERCOUNT: 0  
SAVE: 0  
SAV1: 0  
PASS: 0  
DSKNOR: 0  
HRDR: 0  
BLOCK: 0  
PASSC: 0  
INBUF: 0

; INTERNAL PROGRAM FLAG  
; RANDOM NUMBER PRIME  
; WORKING WORD COUNT  
; WORKING DAE  
; WORKING DAR  
; DATA PATTERN INDEX  
; WORKING DATA BUFFER (OUT-IN)  
; TEMP WORD COUNT  
; TEMP DAR  
; STANDARD WORD COUNT  
; ERROR COUNT FOR MESSAGES.

; POINTER FOR HARD ERROR

;RC11 WORK REGISTERS (CAN BE CHANGED IN ANY ROUTINE)

WORK: 0  
WORK1: 0  
WORK2: 0  
WORK3: 0

```

671 001122 000005          START:  RESET                ;CLEAR THE WORLD
672 001124 012767 000004 177760  CLRTAB: MOV      #4,WORK          ;
673 001132 012700 010272          MOV      #TABLE,%0        ;CLEAR ERROR TABLE
674 001136 005020          CLR      (0)+
675 001140 005367 177746          DEC      WORK
676 001144 001372          BNE     CLRTAB
677 001146 012706 001000          MOV      #1000,%6        ;SET UP STACK
678 001152 004567 004504          JSR     %5,EXTMEN        ;SET UP DATA BUFFERS
679 001156 012706 001000          MOV      #1000,%6        ;RESET STACK
680 001162 012767 006550 176640  MOV      #EMTRP,30       ;SET UP TTY POINTER
681 001170 012767 000340 176634  MOV      #340,32        ;LOCK UP INTERRUPTS
682 001176 012767 003674 176630  MOV      #DISK,34        ;SET UP DISK HANDLER POINTER
683 001204 012767 000340 176624  MOV      #340,36        ;LOCK UP INTERRUPTS
684 001212 012777 000340 177562  MOV      #340,3PS       ;LOCK UP INTERRUPT LEVELS
685 001220 012767 006134 176572  MOV      #XWAIT,20
686 001226 005067 176570          CLR      22
687 001232 012767 007470 176564  MOV      #DOWN,24       ;SET UP PWR FAIL
688 001240 012767 000340 176560  MOV      #340,26        ;LOCK UP INTERRUPTS
689 001246 005067 177572          CLR      FLAG           ;CLEAR PROGRAM FLAG
690 001252 005067 177576          CLR      DMA            ;CLEAR DAR REGISTERS
691 001256 005067 177574          CLR      PATNU          ;CLEAR PATTERN COUNT
692 001262 016767 177600 177560  MOV      SWRDCT,WRDCT
693 001270 004767 006576          JSR     7,MAMF           ;SET PARITY SWITCHES
694 001274 005777 177500          TST     2SWR
695 001300 100464          BMI     LCONM           ;OPERATE UNDER PROGRAM CONTROL
696 001302 052767 070000 177534  BIS     #70000,FLAG
697 001310 005067 006766          CLR     TEXTBUF
698 001314 032777 004000 177500  SPECOR: BIT     #BIT11,3RCCS ;TEST FOR DISK
699 001322 001013          BNE     RCNODV          ;NO DEVICE!
700 001324 022767 000004 006750  CMP     #4,TEXTBUF      ;TESTED FOR ALL DEVICES?
701 001332 001407          BEQ     RCNODV          ;REPORT NUMBER
702 001334 062767 000001 006740  ADD     #1,TEXTBUF      ;INC DEVICE COUNT
703 001342 062777 004000 177460  ADD     #4000,3RCDA     ;ADDRESS NEXT DISK
704 001350 000761          BR      SPECOR
705 001352 005767 006724          RCNODV: TST     TEXTBUF   ;TEST FOR 0 DEVICES
706 001356 001003          BNE     REPDRV         ;REPORT 0 DEVICES
707 001360 104001          EMT+1
708 001362 011352          NODRV
709 001364 000000          HALT
710 001366 004567 005426          REPDRV: JSR     %5,CONV   ;CONVERT TO ASCII FOR PRINT
711 001372 010302          TEXTBUF
712 001374 011377          RKNUM
713 001376 000001          I                       ;TYPE NUMBER OF DRIVES
714 001400 104000          EMT      +0
715 001402 010370          HEDSA
716 001404 011377          RKNUM
717 001406 177777          -1
718 001410 016767 006666 177462  MOV     TEXTBUF,DSKNOR  ;SAVE # OF DISKS
719 001416 162767 000001 177454  SUB     #1,DSKNOR       ;FIRST DISK IS ZERO
720 001424 006167 177450          ROL     DSKNOR          ;SHIFT LEFT TO MATCH FLAG
721 001430 006167 177444          ROL     DSKNOR          ;POSITION
722 001434 052767 004000 177402  BIS     #BIT11,FLAG     ;SET UP PROGRAM FLAG
723 001442 005077 177362          CLR     3RCDA          ;RESET DISK ADDRESS
724 001446 000167 000504          JMP     ADTST
725
726

```

;ENTER OPERATOR CONVERSATION MODE

|     |        |        |        |        |
|-----|--------|--------|--------|--------|
| 727 |        |        |        |        |
| 728 | 001452 |        |        |        |
| 729 | 001452 | 104001 |        |        |
| 730 | 001454 | 010751 |        |        |
| 731 | 001456 | 004767 | 005430 |        |
| 732 | 001462 | 022767 | 000153 | 006612 |
| 733 | 001470 | 001003 |        |        |
| 734 | 001472 | 052767 | 002000 | 177344 |
| 735 | 001500 | 104001 |        |        |
| 736 | 001502 | 011003 |        |        |
| 737 | 001504 | 004767 | 005402 |        |
| 738 | 001510 | 022767 | 000153 | 006564 |
| 739 | 001516 | 001026 |        |        |
| 740 | 001520 | 052767 | 004000 | 177316 |
| 741 | 001526 | 104001 |        |        |
| 742 | 001530 | 011036 |        |        |
| 743 | 001532 | 004767 | 005344 |        |
| 744 | 001536 | 162767 | 000001 | 006536 |
| 745 | 001544 | 022767 | 000004 | 006530 |
| 746 | 001552 | 101765 |        |        |
| 747 | 001554 | 016767 | 006522 | 177316 |
| 748 | 001562 | 006167 | 177312 |        |
| 749 | 001566 | 006167 | 177306 |        |
| 750 | 001572 | 000420 |        |        |

LCONM:  
CONM:

```

EMT      +1
CON1
JSR      %7, ALPHA
CMP      #153, TEXBUF
BNE      .+10
BIS      #BIT10, FLAG
EMT      +1
CON2
JSR      %7, ALPHA
CMP      #153, TEXBUF
BNE      DATTES
BIS      #BIT11, FLAG
EMT      +1
CON3
JSR      %7, NOCHA
SUB      #1, TEXBUF
CMP      #4, TEXBUF
BLOS    DSKDR
MOV      TEXBUF, DSKNOR
ROL      DSKNOR
ROL      DSKNOR
BR       ASKWC

```

;ASK ABOUT DATA TEST ONLY

;GO WAIT FOR ANSWER  
;TEST FOR YES  
;BRANCH IF NO

;ASK ABOUT MULTI DRIVE MODE  
;GO WAIT FOR ANSWER  
;TEST FOR YES

DSKDR:

|     |        |        |        |        |         |        |                |                                |
|-----|--------|--------|--------|--------|---------|--------|----------------|--------------------------------|
| 751 | 001574 | 104001 |        |        | DATTES: | EMT    | +1             |                                |
| 752 | 001576 | 011072 |        |        |         | CON4   |                | ;ASK UNIT NUMBER               |
| 753 | 001600 | 004767 | 005276 |        |         | JSR    | %7, NOCHA      | ;WAIT FOR NO.                  |
| 754 | 001604 | 022767 | 000004 | 006470 |         | CMP    | #4, TEXBUF     | ;IS NO = OR>4                  |
| 755 | 001612 | 101770 |        |        |         | BLOS   | DATTES         | ;NO                            |
| 756 | 001614 | 000241 |        |        |         | CLC    |                |                                |
| 757 | 001616 | 006167 | 006460 |        |         | ROL    | TEXBUF         |                                |
| 758 | 001622 | 006167 | 006454 |        |         | ROL    | TEXBUF         |                                |
| 759 | 001626 | 056767 | 006450 | 177210 |         | BIS    | TEXBUF, FLAG   |                                |
| 760 |        |        |        |        |         |        |                |                                |
| 761 | 001634 | 104001 |        |        | ASKWC:  | EMT    | +1             |                                |
| 762 | 001636 | 011113 |        |        |         | CONS   |                | ;ASK ABOUT OPTIONAL WORD COUNT |
| 763 | 001640 | 004767 | 005246 |        |         | JSR    | %7, ALPHA      | ;WAIT FOR ANSWER               |
| 764 | 001644 | 022767 | 000153 | 006430 |         | CMP    | #153, TEXBUF   |                                |
| 765 | 001652 | 001050 |        |        |         | BNE    | OPPAT          | ;ASK ABOUT OPTIONAL DAR        |
| 766 |        |        |        |        |         |        |                |                                |
| 767 | 001654 | 104001 |        |        | WCCON:  | EMT    | +1             |                                |
| 768 | 001656 | 011151 |        |        |         | CON6   |                | ;ASK LENGTH OF WC              |
| 769 | 001660 | 004567 | 005134 |        |         | JSR    | %5, CONV       |                                |
| 770 | 001664 | 001066 |        |        |         | SWRDCT |                |                                |
| 771 | 001666 | 011170 |        |        |         | CON6A  |                |                                |
| 772 | 001670 | 000006 |        |        |         | 6      |                |                                |
| 773 | 001672 | 104001 |        |        |         | EMT+1  |                |                                |
| 774 | 001674 | 011170 |        |        |         | CON6A  |                |                                |
| 775 | 001676 | 004767 | 005200 |        |         | JSR    | %7, NOCHA      |                                |
| 776 | 001702 | 005767 | 006374 |        |         | TST    | TEXBUF         |                                |
| 777 | 001706 | 001762 |        |        |         | BEG    | WCCON          |                                |
| 778 | 001710 | 016767 | 177152 | 177174 |         | MOV    | SWRDCT, WORK   |                                |
| 779 | 001716 | 005267 | 177170 |        |         | INC    | WORK           |                                |
| 780 | 001722 | 026767 | 177164 | 006352 |         | CMP    | WORK, TEXBUF   | ;IS TEXBUF LESSTHAN SWRDCT     |
| 781 | 001730 | 101751 |        |        |         | BLOS   | WCCON          | ;YES ASK FOR COUNT AGAIN       |
| 782 | 001732 | 016767 | 006344 | 177126 |         | MOV    | TEXBUF, SWRDCT | ;OPERATING WORD COUNT          |
| 783 | 001740 | 016767 | 177122 | 177102 |         | MOV    | SWRDCT, WRDCT  |                                |
| 784 |        |        |        |        |         |        |                |                                |
| 785 | 001746 | 104001 |        |        | OPDAR:  | EMT    | +1             |                                |
| 786 | 001750 | 011201 |        |        |         | CON7   |                | ;ASK ABOUT OPTIONAL DAR        |
| 787 | 001752 | 004767 | 005124 |        |         | JSR    | %7, NOCHA      |                                |
| 788 | 001756 | 022767 | 000100 | 006316 |         | CMP    | #100, TEXBUF   | ;77 MAX SECTOR COUNT           |
| 789 | 001764 | 101770 |        |        |         | BLOS   | OPDAR          |                                |
| 790 | 001766 | 016767 | 006310 | 177060 |         | MOV    | TEXBUF, DMA    | ;TEMP SECTOR REGISTER          |

|     |        |        |        |        |         |       |               |  |                                     |
|-----|--------|--------|--------|--------|---------|-------|---------------|--|-------------------------------------|
| 791 | 001774 | 104001 |        |        | OPPAT:  | EMT   | +1            |  |                                     |
| 792 | 001776 | 011223 |        |        |         | CONB  |               |  | ;ASK ABOUT DATA PATTERNS            |
| 793 | 002000 | 004767 | 005076 |        |         | JSR   | %7,NOCHA      |  |                                     |
| 794 | 002004 | 022767 | 000023 | 006270 |         | CMP   | #23,TEXBUF    |  | ;TEST FOR CORRECT NO                |
| 795 | 002012 | 101770 |        |        |         | BLOS  | OPPAT         |  | ;ASK AGAIN                          |
| 796 | 002014 | 022767 | 000022 | 006260 |         | CMP   | #22,TEXBUF    |  |                                     |
| 797 | 002022 | 001414 |        |        |         | BEQ   | OPWRT         |  | ;DATA PATTERN UNDER PROGRAM CONTROL |
| 798 | 002034 | 052767 | 100000 | 177012 |         | BIS   | #BIT15,FLAG   |  | ;SET PROGRAM FLAG                   |
| 799 | 002032 | 016767 | 006244 | 177016 |         | MOV   | TEXBUF, PATNU |  | ;OPERATOR WANTS TO SELECT DATA      |
| 800 | 002040 | 000241 |        |        |         | CLC   |               |  |                                     |
| 801 | 002042 | 006167 | 177010 |        |         | ROL   | PATNU         |  |                                     |
| 802 | 002046 | 042767 | 070000 | 176770 |         | BIC   | #70000,FLAG   |  | ;CLEAR OP MODE BITS IN FLAG         |
| 803 |        |        |        |        |         |       |               |  |                                     |
| 804 | 002054 | 104001 |        |        | OPWRT:  | EMT   | +1            |  |                                     |
| 805 | 002056 | 011246 |        |        |         | CON9  |               |  | ;ASK ABOUT WRITE                    |
| 806 | 002060 | 004767 | 005026 |        |         | JSR   | %7,ALPHA      |  |                                     |
| 807 | 002064 | 022767 | 000153 | 006210 |         | CMP   | #153,TEXBUF   |  | ;TEST FOR YES                       |
| 808 | 002072 | 001003 |        |        |         | BNE   | OPRD          |  | ;ASK ABOUT WRITE CHECK              |
| 809 | 002074 | 052767 | 040000 | 176742 |         | BIS   | #BIT14,FLAG   |  | ;YES SET FLAG BIT                   |
| 810 |        |        |        |        |         |       |               |  |                                     |
| 811 | 002102 | 104001 |        |        | OPRD:   | EMT   | +1            |  |                                     |
| 812 | 002104 | 011314 |        |        |         | CON11 |               |  | ;ASK ABOUT READ                     |
| 813 | 002106 | 004767 | 005000 |        |         | JSR   | %7,ALPHA      |  |                                     |
| 814 | 002112 | 022767 | 000153 | 006162 |         | CMP   | #153,TEXBUF   |  | ;TEST FOR YES ANSWER                |
| 815 | 002120 | 001003 |        |        |         | BNE   | OPWCK         |  |                                     |
| 816 | 002122 | 052767 | 010000 | 176714 |         | BIS   | #BIT12,FLAG   |  | ;SET FLAG TO READ                   |
| 817 |        |        |        |        |         |       |               |  |                                     |
| 818 | 002130 | 104001 |        |        | OPWCK:  | EMT+1 |               |  |                                     |
| 819 | 002132 | 011266 |        |        |         | CON10 |               |  | ;ASK ABOUT WRITE CHECK              |
| 820 | 002134 | 004767 | 004752 |        |         | JSR   | %7,ALPHA      |  |                                     |
| 821 | 002140 | 022767 | 000153 | 006134 |         | CMP   | #153,TEXBUF   |  |                                     |
| 822 | 002146 | 001003 |        |        |         | BNE   | ADTST         |  |                                     |
| 823 | 002150 | 052767 | 020000 | 176666 |         | BIS   | #BIT13,FLAG   |  |                                     |
| 824 |        |        |        |        |         |       |               |  |                                     |
| 825 | 002156 | 032767 | 004000 | 176660 | ADTST:  | BIT   | #BIT11,FLAG   |  | ;ARE WE IN MULTI DRIVE MODE         |
| 826 | 002164 | 001423 |        |        |         | BEQ   | EXMFLG        |  | ;BRANCH IF NO.                      |
| 827 | 002166 | 104001 |        |        |         | EMT   | +1            |  |                                     |
| 828 | 002170 | 010610 |        |        |         | MES11 |               |  |                                     |
| 829 | 002172 | 016767 | 176646 | 004700 |         | MOV   | FLAG,ACNVX    |  |                                     |
| 830 | 002200 | 006067 | 004674 |        |         | ROR   | ACNVX         |  |                                     |
| 831 | 002204 | 006067 | 004670 |        |         | ROR   | ACNVX         |  |                                     |
| 832 | 002210 | 042767 | 177774 | 004662 |         | BIC   | #177774,ACNVX |  | ;FETCH DRIVE #                      |
| 833 | 002216 | 004567 | 004576 |        |         | JSR   | %5,CONV       |  |                                     |
| 834 | 002222 | 007100 |        |        |         | ACNVX |               |  |                                     |
| 835 | 002224 | 010622 |        |        |         | MES12 |               |  |                                     |
| 836 | 002226 | 000001 |        |        |         | 1     |               |  |                                     |
| 837 | 002230 | 104001 |        |        |         | EMT   | +1            |  |                                     |
| 838 | 002232 | 010622 |        |        |         | MES12 |               |  |                                     |
| 839 | 002234 | 032767 | 002000 | 176602 | EXMFLG: | BIT   | #BIT10,FLAG   |  | ;TEST FOR DATA TEST ONLY            |
| 840 | 002242 | 001402 |        |        |         | BEQ   | +6            |  | ;DO COMPLETE TEST                   |
| 841 | 002244 | 000167 | 000320 |        |         | JMP   | DATAT         |  | ;DO DATA TEST ONLY                  |

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\*\*\*\*\* ADDRESS TEST \*\*\*\*\*

;RC11 ADDRESS TEST #1 (TRACK AND SECTOR SELECTION TEST)

;WRITE 40(OCTAL) WORDS IN EACH SECTOR  
;THE WORD CONTAINS THE ADDRESS OF EACH SECTOR  
;WHEN THE COMPLETE DISK IS WRITTEN READ  
;BACK EACH SECTOR AND COMPARE FOR THE CORRECT  
;DATA IN THE SECTOR

|        |        |        |        |          |       |             |                                |
|--------|--------|--------|--------|----------|-------|-------------|--------------------------------|
| 002250 | 016767 | 176612 | 176614 | ADT1:    | MOV   | SWRDCT,SAVE |                                |
| 002256 | 004567 | 002502 |        |          | JSR   | %5,DSKNOS   | ;SET UP DISK NUMBER            |
| 002262 | 012767 | 000040 | 176576 |          | MOV   | #40,SWRDCT  |                                |
| 002270 | 012767 | 000040 | 176552 |          | MOV   | #40,WRDCT   | ;SETUP WORD COUNT              |
| 002276 | 012767 | 011432 | 176554 |          | MOV   | #OUTBUF,BUF | ;SET UP CURRENT ADDRESS        |
| 002304 | 012706 | 001000 |        |          | MOV   | #1000,%6    | ;SET UP STACK                  |
| 002310 | 005067 | 176540 |        |          | CLR   | DMA         |                                |
| 002314 | 012700 | 011432 |        | SEABUF:  | MOV   | #OUTBUF,%0  | ;SET UP ADDRESS BUFFER         |
| 002320 | 016701 | 176524 |        |          | MOV   | WRDCT,%1    |                                |
| 002324 | 016720 | 176524 |        | XSEABUF: | MOV   | DMA,(0)+    |                                |
| 002330 | 005301 |        |        |          | DEC   | %1          |                                |
| 002332 | 001374 |        |        |          | BNE   | XSEABUF     |                                |
| 002334 | 104403 |        |        |          | WRITE |             | ;WRITE SECTOR                  |
| 002336 | 105777 | 176460 |        |          | TSTB  | @RCCS       | ;CHECK FOR READY               |
| 002342 | 100375 |        |        |          | BPL   | -4          |                                |
| 002344 | 005777 | 176452 |        |          | TST   | @RCCS       | ;TEST FOR ERROR                |
| 002350 | 100011 |        |        |          | BPL   | WRNEXB      | ;BRANCH IF NO ERROR            |
| 002352 | 012767 | 000001 | 176510 | ER1:     | MOV   | #1,ERCOUNT  | ;***** ERROR 1 *****           |
| 002360 | 017767 | 176436 | 176524 |          | MOV   | @RCCS,WORK  | ;FETCH CONTENTS OF CONTROL REG |
| 002366 | 004567 | 004024 |        | ERR1:    | JSR   | %5,STAER    | ;REPORT ERROR                  |
| 002372 | 000750 |        |        |          | BR    | SEABUF      | ;LOOP ON ERROR                 |
| 002374 | 004767 | 002012 |        | WRNEXB:  | JSR   | %7,DISBUF   | ;SET UP NEXT DISK ADDR.        |
| 002400 | 000745 |        |        |          | BR    | SEABUF      | ;WRITE NEXT SECTOR             |
| 002402 | 005067 | 176446 |        |          | CLR   | DMA         |                                |
| 002406 | 016767 | 176476 | 176444 | SETADT:  | MOV   | INBUF,BUF   | ;SET UP CURRENT ADDRESS        |

```

877 002414 104405          RDSECT: READ
878 002416 105777 176400  TSTB      JRCCS      ;CHECK FOR READY
879 002422 100375          BPL      -4      ;NOT READY BRANCH BACK
880 002424 005777 176372  TST      JRCCS      ;TEST FOR ERROR
881 002430 100014          BPL      ADHGT     ;BRANCH IF NO ERROR
882 002432 017767 176364 176452  MOV      JRCCS,WORK ;FETCH CONTROL REG
883 002440 017767 176364 176446  MOV      JRCDA,WORK1 ;FETCH DISK ADDR
884 002446 012767 000002 176414  ER2:    MOV      #2,ERCJUNT ;***** ERROR 2 *****
885 002454 004567 004000  ERR2:   JSR      %5,STAER1 ;REPORT ERROR
886 002460 000755          BR      RDSECT    ;LOOP ON ERROR
887 002462 016700 176422  ADHGT:  MOV      INBUF,%0
888 002466 012701 000040          MOV      #40,%1
889 002472 026710 176356  SANHT:  CMP      DMA,(0) ;CMP FOR CORRECT ADDR.
890 002476 001004          BNE      ADERR    ;BRANCH IF DATA DID NOT COMPARE
891 002500 005720          INCADT: TST      (0)+
892 002502 005301          DEC      %1
893 002504 001372          BNE      SANHT    ;TEST NEXT WORD
894 002506 000412          BR      CHKADT
895 002510 016767 176340 176376  ADERR:  MOV      DMA,WORK1 ;CORRECT ADDRESS
896 002516 011067 176370          MOV      (0),WORK ;DATA IN ERROR
897 002522 012767 000003 176340  ER3:    MOV      #3,ERCOUNT ;***** ERROR 3 *****
898 002530 004567 003724  ERR3:   JSR      %5,STAER1 ;REPORT ERROR
899
900          ;*****REPORT ONLY ONE ERROR PER SECTOR*****
901
902 002534 004767 001652  CHKADT: JSR      %7,DISBUF ;SET UP NEXT DISK BUFFER
903 002540 000725          BR      RDSECT    ;CHECK NEXT SECTOR
904 002542 016767 176324 176316  MOV      SAVE,SWRDCT ;RESTORE STANDARD WORD COUNT
905 002550 032777 004000 176222  BIT      #BIT11,JSWR ;DOES OPERATOR WANT TO LOOP ON TEST
906 002556 001402          BEQ
907 002560 000167 177464          JMP      ADT1

```

|     |        |        |        |        |         |       |                 |                                |
|-----|--------|--------|--------|--------|---------|-------|-----------------|--------------------------------|
| 908 | 002564 | 005067 | 176264 |        | ADT3:   | CLR   | DMA             |                                |
| 909 |        |        |        |        |         |       |                 |                                |
| 910 | 002570 | 016767 | 176272 | 176252 | DATAT:  | MOV   | SWRDCT, WRDCT   |                                |
| 911 | 002576 | 012777 | 003776 | 176232 |         | MOV   | #DKINT, @VECTOR |                                |
| 912 | 002604 | 012777 | 000340 | 176226 |         | MOV   | #340, @STATUS   |                                |
| 913 | 002612 | 012767 | 002632 | 176262 |         | MOV   | #LDAT, @RDR     | ; SETUP FOR HARD ERROR         |
| 914 | 002620 | 012777 | 000340 | 176154 |         | MOV   | #340, @PS       | ; LOCK UP PROCESSOR PRIORITY   |
| 915 | 002626 | 004567 | 002270 |        |         | JSR   | %5, @ASEL       | ; SET UP DATA BUFFERS          |
| 916 | 002632 | 004567 | 001464 |        | LDAT:   | JSR   | %5, @DSEL       | ; SET UP DISK ADDRESS          |
| 917 | 002636 | 032767 | 040000 | 176200 |         | BIT   | #BIT14, FLAG    | ; TEST FOR WRITE               |
| 918 | 002644 | 001421 |        |        |         | BEQ   | ESH             | ; TEST FOR READ                |
| 919 | 002646 | 012767 | 011432 | 176204 |         | MOV   | #OUTBUF, BUF    | ; SETUP OUTPUT BUFFER          |
| 920 | 002654 | 104503 |        |        |         | WRITE | +100            | ; WRITE WITH INT. ENABLED      |
| 921 | 002656 | 032777 | 001000 | 176114 |         | BIT   | #BIT9, @SWR     | ; FIND OUT HOW TO WAIT FOR INT |
| 922 | 002664 | 001002 |        |        |         | BNE   | WRWAIT          | ; WAIT WITH WAIT INSTRUCTION   |
| 923 | 002666 | 000004 |        |        |         | IOT   |                 | ; WAIT IN BACKGROUND TEST      |
| 924 | 002670 | 000404 |        |        |         | BR    | XSLH            |                                |
| 925 | 002672 | 016777 | 176144 | 176102 | WRWAIT: | MOV   | PRIORITY, @PS   |                                |
| 926 | 002700 | 000001 |        |        |         | WAIT  |                 | ; WAIT FOR FLAG                |
| 927 | 002702 | 004767 | 001504 |        | XSLH:   | JSR   | %7, DISBUF      | ; SET BUFFER FOR WRITE         |
| 928 | 002706 | 000751 |        |        |         | SR    | LDAT            |                                |
| 929 | 002710 | 004567 | 001406 |        | ESH:    | JSR   | %5, @DSEL       | ; OPERATOR SELECTED CYLINDER?  |
| 930 | 002714 | 032767 | 010000 | 176122 |         | BIT   | #BIT12, FLAG    | ; TEST FOR READ                |
| 931 | 002722 | 001451 |        |        |         | BEQ   | SLH             |                                |
| 932 | 002724 | 016767 | 176160 | 176126 |         | MOV   | INBUF, BUF      | ; SETUP OUTPUT BUFFER          |
| 933 | 002732 | 042767 | 000003 | 176104 |         | BIC   | #3, FLAG        | ; CLEAR RE-READ COUNT          |

|     |        |        |        |        |         |         |              |                                      |
|-----|--------|--------|--------|--------|---------|---------|--------------|--------------------------------------|
| 934 | 002740 | 012777 | 000340 | 176034 | DSKRD:  | MOV     | #340,APS     |                                      |
| 935 | 002746 | 005267 | 176072 |        |         | INC     | FLAG         |                                      |
| 936 | 002752 | 104505 |        |        |         | READ    | +100         | ;READ + INT ENABLE                   |
| 937 | 002754 | 032777 | 001000 | 176016 |         | BIT     | #BIT9,ASWR   | ;FIND OUT HOW TO WAIT FOR INT.       |
| 938 | 002762 | 001002 |        |        |         | BNE     | RDWAIT       | ;WAIT WITH WAIT INSTRUCTION          |
| 939 | 002764 | 000004 |        |        |         | IOT     |              |                                      |
| 940 | 002766 | 000404 |        |        |         | BR      | ELH          |                                      |
| 941 | 002770 | 016777 | 176046 | 176004 | RDWAIT: | MOV     | PRIORITY,APS | ;SET UP PRIORITY                     |
| 942 | 002776 | 000001 |        |        |         | WAIT    |              | ;WAIT FOR FLAG                       |
| 943 | 003000 | 032777 | 010000 | 175772 | ELH:    | BIT     | #BIT12,ASWR  |                                      |
| 944 | 003006 | 001002 |        |        |         | BNE     | ADRD         |                                      |
| 945 | 003010 | 004567 | 002342 |        |         | JSR     | %5,COMPARE   | ;COMPARE OUTBUFFER TO INBUFFER       |
| 946 | 003014 | 016767 | 176024 | 176070 | ADRD:   | MOV     | FLAG,WORK    | ;CHECK DISK RE-READ COUNT            |
| 947 | 003022 | 042767 | 177774 | 176062 |         | BIC     | #177774,WORK | ;DO 3 RE-READS.                      |
| 948 | 003030 | 022767 | 000003 | 176054 |         | CMP     | #3,WORK      |                                      |
| 949 | 003036 | 001340 |        |        |         | BNE     | DSKRD        | ;DO ANOTHER RE-READ                  |
| 950 | 003040 | 004767 | 001346 |        |         | JSR     | %7,DISBUF    | ;GO SET UP DISK BUFFER.              |
| 951 | 003044 | 000721 |        |        |         | BR      | ESH          |                                      |
| 952 | 003046 | 004567 | 001250 |        | SLH:    | JSR     | %5,OPDSEL    | ;IS THE OPERATOR SELECTING THE TRACK |
| 953 | 003052 | 032767 | 020000 | 175764 |         | BIT     | #BIT13,FLAG  | ;TEST FOR WRITE CHECK                |
| 954 | 003060 | 001424 |        |        |         | BEQ     | MSTR         |                                      |
| 955 | 003062 | 012767 | 011432 | 175770 |         | MOV     | #OUTBUF,BUF  | ;SET UP CURRENT ADDRESS              |
| 956 | 003070 | 012777 | 000340 | 175704 |         | MOV     | #340,APS     |                                      |
| 957 | 003076 | 104507 |        |        |         | WRCHECK | +100         |                                      |
| 958 | 003100 | 032777 | 001000 | 175672 |         | BIT     | #BIT9,ASWR   |                                      |
| 959 | 003106 | 001002 |        |        |         | BNE     | WCWAIT       | ;WAIT FOR FLAG IN WAIT INST.         |
| 960 | 003110 | 000004 |        |        |         | IOT     |              | ;WAIT FOR FLAG IN BACKGROUND TEST    |
| 961 | 003112 | 000404 |        |        |         | BR      | XESH         |                                      |
| 962 | 003114 | 016777 | 175722 | 175660 | WCWAIT: | MOV     | PRIORITY,APS |                                      |
| 963 | 003122 | 000001 |        |        |         | WAIT    |              | ;WAIT FOR THE FLAG                   |
| 964 | 003124 | 004767 | 001262 |        | XESH:   | JSR     | %7,DISBUF    | ;SET UP THE DISK BUFFER              |
| 965 | 003130 | 000746 |        |        |         | BR      | SLH          |                                      |
| 966 | 003132 | 005767 | 175706 |        | MSTR:   | TST     | FLAG         |                                      |
| 967 | 003136 | 100002 |        |        |         | BPL     | .+6          | ;UNDER PROGRAM CONTROL               |
| 968 | 003140 | 000167 | 000374 |        |         | JMP     | EXTPPR       | ;OPERATOR SELECTED PATTERN           |
| 969 | 003144 | 062767 | 000002 | 175704 |         | ADD     | #2,PATNU     | ;INC PATTERN INDEX                   |
| 970 | 003152 | 022767 | 000044 | 175676 |         | CMP     | #44,PATNU    |                                      |
| 971 | 003160 | 001402 |        |        |         | BEQ     | .+6          |                                      |
| 972 | 003162 | 000167 | 177402 |        |         | JMP     | DATAT        | ;NOT LAST PATTERN EXIT               |
| 973 | 003166 | 005067 | 175664 |        |         | CLR     | PATNU        | ;LAST PATTERN EXIT                   |

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974                                     ;THIS IS A RANDOM ADDRESS RANDOM DATA TEST
975
976 003172 012706 001000                RANEX: MOV      #1000,%6
977 003176 012767 177000 175702        MOV      #-1000,PASSC      ;SET UP PASS COUNT
978 003204 042767 001000 175632        BIC      #BIT9,FLAG      ;CLR ERROR FLAG BIT
979 003212 012767 003442 175662        MOV      #RANER,HRDR     ;SET UP FOR HARD ERROR
980 003220 012777 003776 175610        MOV      #DKINT,%VECTOR  ;SET UP INTERRUPT VECTOR
981 003226 012777 000340 175604        MOV      #340,%STATUS
982 003234 016777 175602 175540        MOV      PRIORITY,%PS   ;SET PRIORITY TO LEVEL 5
983 003242 012767 000001 175642        WRLG: MOV      #1,WORK    ;SET UP RANDOM GENERATOR WORD
984 003250 012701 011432                MOV      #OUTBUF,%1
985 003254 004567 001702                JSR      %5,RANDOM      ;GENERATE RANDOM DATA
986 003260 016767 006146 175566        MOV      OUTBUF,DMA     ;SET UP DISK ADDRESS
987 003266 042767 174000 175560        BIC      #174000,DMA
988 003274 012767 000040 175546        MOV      #40,WRDCT      ;SET UP WORD COUNT =1SECTOR
989 003302 016767 175542 175602        MOV      WRDCT,WORK     ;GENERATE RANDOM BUFFER
990 003310 012701 011432                MOV      #OUTBUF,%1
991 003314 004567 001642                JSR      %5,RANDOM
992 003320 012767 011432 175532        MOV      #OUTBUF,BUF    ;SET UP OUTPUT BUFFER
993 003326 104503                        WRITE   +100
994 003330 032777 001000 175442        BIT      #BIT9,%SWR
995 003336 001002                        BNE     .+6
996 003340 000004                        IOT
997 003342 000404                        BR      .+12
998 003344 016777 175472 175430        MOV      PRIORITY,%PS   ;LOCK UP CPU
999 003352 000001                        WAIT
1000 003354 104507                        WRCHECK +100            ;WRITE CHECK THE DISK
1001 003356 032777 001000 175414        BIT      #BIT9,%SWR
1002 003364 001002                        BNE     .+6
1003 003366 000004                        IOT
1004 003370 000404                        BR      .+12
1005 003372 016777 175444 175402        MOV      PRIORITY,%PS
1006 003400 000001                        WAIT
1007 003402 016767 175502 175450        MOV      INBUF,BUF
1008 003410 104505                        READ   +100
1009 003412 032777 001000 175360        BIT      #BIT9,%SWR
1010 003420 001002                        BNE     .+6
1011 003422 000004                        IOT
1012 003424 000404                        BR      .+12
1013 003426 016777 175410 175346        MOV      PRIORITY,%PS
1014 003434 000001                        WAIT
1015 003436 004567 001714                JSR      %5,COMPARE     ;COMPARE THE DATA FOR ERRORS

```

|      |        |        |        |        |        |           |             |                               |
|------|--------|--------|--------|--------|--------|-----------|-------------|-------------------------------|
| 1016 | 003442 | 032767 | 001000 | 175374 | RANER: | BIT       | #BIT9,FLAG  | ;TEST FOR ERRORS              |
| 1017 | 003450 | 001422 |        |        |        | BEQ       | EXRAX       | ;NO ERRORS                    |
| 1018 | 003452 | 042767 | 001000 | 175364 |        | BIC       | #BIT9,FLAG  |                               |
| 1019 | 003460 | 004567 | 003334 |        |        | JSR       | %5,CONV     | ;SET UP FOR ADDRESS REPORT    |
| 1020 | 003464 | 001054 |        |        |        | DMA       |             |                               |
| 1021 | 003466 | 010435 |        |        |        | MES1      |             |                               |
| 1022 | 003470 | 000006 |        |        |        | 6         |             |                               |
| 1023 | 003472 | 004567 | 003322 |        |        | JSR       | %5,CONV     | ;SET UP WORD COUNT FOR REPORT |
| 1024 | 003476 | 001050 |        |        |        | WRDCT     |             |                               |
| 1025 | 003500 | 010521 |        |        |        | MES3      |             |                               |
| 1026 | 003502 | 000006 |        |        |        | 6         |             |                               |
| 1027 | 003504 | 104000 |        |        |        | EMT+0     |             |                               |
| 1028 | 003506 | 010403 |        |        |        | HED6      |             |                               |
| 1029 | 003510 | 010435 |        |        |        | MES1      |             |                               |
| 1030 | 003512 | 010521 |        |        |        | MES3      |             |                               |
| 1031 | 003514 | 177777 |        |        |        | -1        |             |                               |
| 1032 | 003516 | 005267 | 175364 |        | EXRAX: | INC PASSC |             | ;+1 PASS COUNT                |
| 1033 | 003522 | 001247 |        |        |        | BNE       | WRLG        | ;BRANCH IF TEST NNT OVER      |
| 1034 | 003524 | 032777 | 004000 | 175246 |        | BIT       | #BIT11,@SWR | ;LOOP ON TEST                 |
| 1035 | 003532 | 001402 |        |        |        | BEQ       | +6          |                               |
| 1036 | 003534 | 000167 | 177432 |        |        | JMP       | RANEX       | ;YES LOOP ON TEST             |

```

1037      ;CHECK FOR MULTI DISK MODE
1038      ;IF IN MULTI DISK MODE REPORT "END"
1039      ;IF LAST DISK ON SYSTEM HAS BEEN
1040      ;EXERCISED.
1041
1042 003540 005067 175310      EXTPPR: CLR      DMA
1043 003544 032767 004000 175272      BIT      #BIT11,FLAG      ;ARE WE IN MULTI DISK MODE
1044 003552 001432      BEQ      REPOEN      ;REPORT "END"
1045 003554 016767 175264 175330      CHKDOS: MOV      FLAG,WORK      ;WHAT DISK ARE WE ON
1046 003562 042767 177763 175322      BIC      #177763,WORK      ;IF LAST DISK ON SYSTEM
1047 003570 026767 175316 175302      CMP      WORK,DSKNOR      ;REPORT END
1048 003576 001420      BEQ      REPOEN
1049 003600 016703 175306      MOV      WORK,%3      ;SET UP INDEX POINTER
1050 003604 000241      CLC
1051 003606 006003      ROR      %3      ;NORMALIZE
1052 003610 022763 000020 010272      CMP      #20,TABLE(3)      ;WHAT IS ERROR COUNT
1053 003616 101004      BHI      DRVEROK      ;LESS THAN 20(8)-CONTINUE
1054 003620 062767 000004 175216      ADD      #4,FLAG      ;INC. DISK NO.
1055 003626 000752      BR
1056 003630 062767 000004 175206      DRVEROK: ADD      #4,FLAG      ;INC. DISK NO.
1057 003636 000414      BR      EXTPP      ;EXERCISE DISK
1058 003640 104001      REPOEN: EMT      +1
1059 003642 011423      END      ;REPORT END OF PASS
1060 003644 042767 000014 175172      BIC      #14,FLAG
1061 003652 013700 000042      MOV      #42,%0      ;GET MONITOR ADDRESS
1062 003656 001404      BEQ      EXTPP      ;SKIP IF NO HOOK
1063 003660 004710      LOGICAL: JSR      7,(0)      ;GO TO MONITOR
1064 003662 000240      NOP
1065 003664 000240      NOP
1066 003666 000240      NOP
1067 003670 000167 176262      EXTPP:  JMP      ADTST      ;RECYCLE
1068
1069
1070      ;ENTER DISK HANDLER BY THE TRAP INSTRUCTION
1071      ;ARGUMENT TO TRAP INSTRUCTION IS TWO ORDER
1072      ;BYTE OF THE CONTROL REGISTER.
1073
1074 003674 012705 001030      DISK:  MOV      #RCDA,%5      ;SET UP TO LOAD DISK REG
1075 003700 016775 175150 000000      MOV      DMA,a(5)      ;LOAD WORD ADDRESS
1076 003706 016767 175132 175176      MOV      FLAG,WORK
1077 003714 000367 175172      SWAB     WORK
1078 003720 006167 175166      ROL      WORK
1079 003724 042767 163777 175160      BIC      #163777,WORK
1080 003732 056775 175154 000000      BIS      WORK,a(5)
1081 003740 016755 175114      MOV      BUF,a-(5)      ;SET UP CURRENT ADDRESS
1082 003744 016755 175100      MOV      WRDCT,a-(5)      ;LOAD WORD COUNT
1083 003750 005475 000000      NEG      a(5)      ;SET UP TWO'S COMPLEMENT
1084 003754 011604      MOV      (6),%4
1085 003756 014467 175130      MOV      -(4),WORK      ;
1086 003762 042767 177600 175122      BIC      #177600,WORK
1087 003770 016755 175116      MOV      WORK,a-(5)      ;LOAD FUNCTION REG.
1088 003774 000002      RTI      ;RETURN FROM TRAP

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1089          ;RC11 DISK INTERRUPT HANDLER
1090          ;ROUTINE CONTINUES ON ERRORS
1091
1092 003776 005046          DKINT: CLR      -(6)          ;CLEAR STACK
1093 004000 012746 004006  MOV      #1$,-(6)      ;SET RETURN
1094 004004 000002          RTI
1095 004006 005777 175010  1$:  TST      @RCCS      ;CLEAR T BIT
1096 004012 100402          BMI      +6          ;TEST FOR ERROR
1097 004014 000167 000252  JMP      INTEXT      ;JUMP IF NO ERRORS
1098 004020 004767 004224  JSR      %7,INCTAB   ;INC ERROR COUNT
1099 004024 052767 001000 175012  BIS      #BIT9,FLAG  ;SET ERROR BIT
1100 004032 017767 174762 175052  MOV      @RCER,WORK  ;REPORT ERROR
1101 004040 004567 002754  JSR      %5,CONV     ;CONVERT TO ASCII
1102 004044 001112          WORK
1103 004046 010452          MES1A
1104 004050 000006          6
1105 004052 104001          EMT+1
1106 004054 010323          HED2
1107 004056 032777 000002 174736  BIT      #BIT1,@RCCS ;CHECK FOR READ
1108 004064 001015          BNE      REDA        ;IF READING REPORT WHICH READ
1109 004066 016767 174752 175016  MOV      FLAG,WORK
1110 004074 042767 177774 175010  BIC      #177774,WORK
1111 004102 004567 002712  JSR      %5,CONV
1112 004106 001112          WORK
1113 004110 010625          MES13
1114 004112 000001          1
1115 004114 104001          EMT+1
1116 004116 010625          MES13

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|      |        |        |        |        |          |       |              |                             |
|------|--------|--------|--------|--------|----------|-------|--------------|-----------------------------|
| 1117 | 004120 | 017767 | 174704 | 174764 | REDA:    | MOV   | DRCCA,WORK   | ;SET UP 16 BITS OF ADDR.    |
| 1118 | 004126 | 004567 | 002666 |        |          | JSR   | %5,CONV      | ;CONVERT TO ASCII           |
| 1119 | 004132 | 001112 |        |        |          | WORK  |              |                             |
| 1120 | 004134 | 010435 |        |        |          | MES1  |              |                             |
| 1121 | 004136 | 000006 |        |        |          | 6     |              |                             |
| 1122 | 004140 | 104000 |        |        |          | EMT+0 |              |                             |
| 1123 | 004142 | 010452 |        |        |          | MES1A |              |                             |
| 1124 | 004144 | 010435 |        |        |          | MES1  |              |                             |
| 1125 | 004146 | 177777 |        |        |          | -1    |              |                             |
| 1126 | 004150 | 017767 | 174646 | 174734 |          | MOV   | DRCCS,WORK   | ;SET UP STATUS              |
| 1127 | 004156 | 004567 | 002636 |        |          | JSR   | %5,CONV      |                             |
| 1128 | 004162 | 001112 |        |        |          | WORK  |              |                             |
| 1129 | 004164 | 010467 |        |        |          | MES2  |              |                             |
| 1130 | 004166 | 000006 |        |        |          | 6     |              |                             |
| 1131 | 004170 | 104001 |        |        |          | EMT+1 |              |                             |
| 1132 | 004172 | 010467 |        |        |          | MES2  |              |                             |
| 1133 | 004174 | 032777 | 040000 | 174620 | CKHRDER: | BIT   | #BIT14,DRCCS | ;TEST FOR HARD ERROR        |
| 1134 | 004202 | 001411 |        |        |          | BEQ   | SOFTER       | ;GO AND CONTINUE SOFT ERROR |
| 1135 | 004204 | 012706 | 001000 |        | HRDEXIT: | MOV   | #1000,%6     |                             |
| 1136 | 004210 | 032777 | 002000 | 174562 |          | BIT   | #BIT10,DSWR  | ;HALT ON ERROR              |
| 1137 | 004216 | 001401 |        |        |          | BEQ   | .+4          |                             |
| 1138 | 004220 | 000000 |        |        |          | HALT  |              | ;YES HALT BIT 10 SET IN SWR |
| 1139 | 004222 | 000177 | 174654 |        |          | JMP   | DRDRER       | ;EXIT HARD ERROR            |

|      |        |        |        |        |             |              |  |                                   |
|------|--------|--------|--------|--------|-------------|--------------|--|-----------------------------------|
| 1140 | 004226 | 005777 | 174572 |        | SOFTER: TST | JRCWC        |  | :CHECK FOR X-FER DONE             |
| 1141 | 004232 | 001417 |        |        | BEQ         | INTEXT       |  | :EXIT FROM ROUTINE                |
| 1142 | 004234 | 032777 | 001000 | 174536 | BIT         | #BIT9,JSWR   |  |                                   |
| 1143 | 004242 | 001402 |        |        | BEQ         | +.6          |  |                                   |
| 1144 | 004244 | 162716 | 000002 |        | SUB         | #2,(6)       |  | :X-FER NOT DONE SET UP FOR RETURN |
| 1145 | 004250 | 032777 | 002000 | 174522 | BIT         | #BIT10,JSWR  |  | :HALT ON ERROR                    |
| 1146 | 004256 | 001401 |        |        | BEQ         | +.4          |  |                                   |
| 1147 | 004260 | 000000 |        |        | HALT        |              |  | :YES HALT BIT10 SET IN SWR        |
| 1148 | 004262 | 052777 | 000001 | 174532 | BIS         | #1,DRCCS     |  | :GO                               |
| 1149 | 004270 | 000002 |        |        | RTI         |              |  | :RETURN TO WAIT INSTR.            |
| 1150 |        |        |        |        |             |              |  |                                   |
| 1151 | 004272 | 032777 | 020000 | 174500 | INTEXT: BIT | #BIT13,JSWR  |  | :HALT ON COMPLETION FLAG          |
| 1152 | 004300 | 001401 |        |        | BEQ         | +.4          |  |                                   |
| 1153 | 004302 | 000000 |        |        | HALT        |              |  | :YES BIT 13 SET IN SWR HALT       |
| 1154 | 004304 | 032777 | 001000 | 174466 | BIT         | #BIT9,JSWR   |  |                                   |
| 1155 | 004312 | 001002 |        |        | BNE         | +.6          |  |                                   |
| 1156 | 004314 | 012706 | 000774 |        | MOV         | #774,%6      |  | :RESET STACK                      |
| 1157 | 004320 | 000002 |        |        | RTI         |              |  | :EXIT                             |
| 1158 |        |        |        |        |             |              |  |                                   |
| 1159 |        |        |        |        |             |              |  |                                   |
| 1160 |        |        |        |        |             |              |  |                                   |
| 1161 |        |        |        |        |             |              |  |                                   |
| 1162 |        |        |        |        |             |              |  |                                   |
| 1163 |        |        |        |        |             |              |  |                                   |
| 1164 | 004322 | 032777 | 000040 | 174450 | OPDSEL: BIT | #BIT5,JSWR   |  | :DOES SWR CONTAIN CYLINDER #      |
| 1165 | 004330 | 001001 |        |        | BNE         | +.4          |  |                                   |
| 1166 | 004332 | 000205 |        |        | RTS         | %5           |  | :NO! EXIT                         |
| 1167 | 004334 | 017767 | 174440 | 174550 | MOV         | JSWR,WORK    |  | :FETCH SWR                        |
| 1168 | 004342 | 042767 | 177740 | 174542 | BIC         | #177740,WORK |  | :MASK CYLINDER BITS               |
| 1169 | 004350 | 000241 |        |        | CLC         |              |  |                                   |
| 1170 | 004352 | 006167 | 174534 |        | ROL         | WORK         |  |                                   |
| 1171 | 004356 | 006167 | 174530 |        | ROL         | WORK         |  |                                   |
| 1172 | 004362 | 006167 | 174524 |        | ROL         | WORK         |  |                                   |
| 1173 | 004366 | 006167 | 174520 |        | ROL         | WORK         |  |                                   |
| 1174 | 004372 | 006167 | 174514 |        | ROL         | WORK         |  |                                   |
| 1175 | 004376 | 006167 | 174510 |        | ROL         | WORK         |  |                                   |
| 1176 | 004402 | 056767 | 174504 | 174444 | BIS         | WORK,DMA     |  | :LOAD CYLINDER BITS               |
| 1177 | 004410 | 000205 |        |        | RTS         | %5           |  | :EXIT                             |

:ROUTINE TO SET UP CYLINDER # FROM SWR  
:CYLINDER NO. IN SWR 7-0  
:ENTER FROM JSR %5, OPDSEL

```

1178      ;ROUTINE TO SETUP DISK BUFFERS
1179      ;ADD WORD COUNT TO STARTING DISK ADDRESSES
1180      ;COMPARE CALCULATED ADDRESS TO TERMINATING ADDRESS
1181
1182 004412 032777 000400 174360 DISBUF: BIT      #BIT8,JSWR
1183 004420 001401          BEQ      .+4
1184 004422 000207          RTS      %7
1185 004424 004767 000370          JSR      %7,BLSZ      ;DEFINE BLOCK SIZE
1186 004430 016767 174450 174456          MOV      BLOCK,WORK1
1187 004436 005267 174412          INCSEC: INC      DMA      ;+1 SECTOR COUNT
1188 004442 022767 004000 174404          CMP      #4000,DMA      ;DONE YET?
1189 004450 001467          BEQ      BUFEXIT      ;YES
1190 004452 005367 174426          DECBLK: DEC      BLOCK      ;-1 FROM BLOCK COUNT
1191 004456 001401          BEQ      COMDAR      ;CMP DMA TO RCDA
1192 004460 000766          BR       INCSEC      ;RECYCLE
1193 004462 016767 174356 174430 COMDAR: MOV      FLAG,WORK3
1194 004470 000367 174424          SWAB     WORK3
1195 004474 006167 174420          ROL      WORK3
1196 004500 042767 163777 174412          BIC      #163777,WORK3
1197 004506 066767 174342 174404          ADD      DMA,WORK3
1198 004514 042767 020000 174376          BIC      #20000,WORK3
1199 004522 026777 174372 174300          CMP      WORK3,RCDA      ;COMPARE LOWER 16 BITS
1200 004530 001434          BEQ      CMDAE
1201 004532 004567 002262          ERADR: JSR      %5,CONV      ;CONVERT DMA REG COUNT TO ASCII
1202 004536 001120          WORK3
1203 004540 010421          MESO
1204 004542 000006          6
1205 004544 017767 174260 174340          MOV      RCDA,WORK
1206 004552 004567 002242          JSR      %5,CONV
1207 004556 001112          WORK
1208 004560 010435          MES1
1209 004562 000006          6
1210 004564 104000          EMT      +0      ;REPORT ERROR
1211 004566 010342          HED4
1212 004570 010421          MESO
1213 004572 010435          MES1
1214 004574 177777          -1
1215 004576 004767 003446          JSR      %7,INCTAB      ;INC ERROR COUNT
1216 004602 005067 174246          CLR      DMA      ;DISK ADDRESS ERROR RESTART PROGRAM
1217 004606 032777 002000 174164          BIT      #BIT10,JSWR      ;HALT ON ERROR
1218 004614 001401          BEQ      .+4
1219 004616 000000          HALT
1220 004620 000207          RTS      %7      ;SWITCH 10 SET IN SWR HALT
1221
1222 004622 105767 174216          CMDAE: TSTB     FLAG
1223 004626 100013          BPL      BUFINX      ;CHECK FOR LAST DISK BUFFER

```

|      |        |        |        |        |              |              |                |                                     |
|------|--------|--------|--------|--------|--------------|--------------|----------------|-------------------------------------|
| 1224 | 004630 | 005067 | 174220 |        | BUFEXIT: CLR | DMA          |                | ;CLEAR ADDRESS BITS                 |
| 1225 | 004634 | 062716 | 000002 |        |              | ADD          | #2 (6)         | ;INC STOCK POINTER                  |
| 1226 | 004640 | 042767 | 000200 | 174176 | AKH: BIC     | #200, FLAG   |                |                                     |
| 1227 | 004646 | 016767 | 174214 | 174174 |              | MOV          | SWORDCT, WRDCT |                                     |
| 1228 | 004654 | 000442 |        |        |              | BR           | EXTDR          | ;EXIT                               |
| 1229 | 004656 | 005067 | 174234 |        | BUFINX: CLR  | WORK2        |                | ;BLOCK COUNT                        |
| 1230 | 004662 | 016767 | 174166 | 174222 |              | MOV          | DMA, WORK      |                                     |
| 1231 | 004670 | 005267 | 174222 |        | XINCSEC: INC | WORK2        |                | ;NEW BLOCK COUNT                    |
| 1232 | 004674 | 022767 | 003777 | 174210 |              | CMP          | #3777, WORK    | ;CMP FOR LAST SECTOR                |
| 1233 | 004702 | 001406 |        |        |              | BEQ          | XINC SUR       | ;+1 SURFACE                         |
| 1234 | 004704 | 005267 | 174202 |        |              | INC          | WORK           |                                     |
| 1235 | 004710 | 005367 | 174200 |        | CONTINC: DEC | WORK1        |                | ;DEC BLOCK COUNT                    |
| 1236 | 004714 | 001365 |        |        |              | BNE          | XINCSEC        | ;LAST BLOCK?                        |
| 1237 | 004716 | 000750 |        |        |              | BR           | AKH            | ;SO ANOTHER STANDARD WD COUNT       |
| 1238 | 004720 | 016767 | 174172 | 174122 | XINCSUR: MOV | WORK2, WRDCT |                | ;CONVERT BLOCK COUNT TO WC          |
| 1239 | 004726 | 000241 |        |        |              | CLC          |                |                                     |
| 1240 | 004730 | 006167 | 174114 |        |              | ROL          | WRDCT          |                                     |
| 1241 | 004734 | 006167 | 174110 |        |              | ROL          | WRDCT          |                                     |
| 1242 | 004740 | 006167 | 174104 |        |              | ROL          | WRDCT          |                                     |
| 1243 | 004744 | 006167 | 174100 |        |              | ROL          | WRDCT          |                                     |
| 1244 | 004750 | 006167 | 174074 |        |              | ROL          | WRDCT          |                                     |
| 1245 | 004754 | 052767 | 000200 | 174062 |              | BIS          | #200, FLAG     |                                     |
| 1246 | 004762 | 000207 |        |        | EXTDR: RTS   | %7           |                | ;EXIT                               |
| 1247 |        |        |        |        |              |              |                |                                     |
| 1248 |        |        |        |        |              |              |                |                                     |
| 1249 |        |        |        |        |              |              |                |                                     |
| 1250 | 004764 | 016767 | 174054 | 174120 | DSKNOS: MOV  | FLAG, WORK   |                | ;FETCH THE FLAG WORD                |
| 1251 | 004772 | 000367 | 174114 |        |              | SWAB         | WORK           |                                     |
| 1252 | 004776 | 006167 | 174110 |        |              | ROL          | WORK           |                                     |
| 1253 | 005002 | 042767 | 163777 | 174102 |              | BIC          | #163777, WORK  | ;MASK THE DISK NUMBER               |
| 1254 | 005010 | 056777 | 174076 | 174012 |              | BIS          | WORK, ARCD A   | ;LOAD THE ADDRESS IN TH ADDRESS REG |
| 1255 | 005016 | 000205 |        |        |              | RTS          | %5             | ;EXIT                               |

;ROUTINE TO SET UP THE DISK NUMBER FOR THE ADDRESS TEST



```

1288
1289
1290 005162 016700 000122
1291 005166 016704 000120
1292 005172 012703 000007
1293 005176 005002
1294 005200 006300
1295 005202 006104
1296 005204 006102
1297 005206 005303
1298 005210 001373
1299 005212 066700 000072
1300 005216 005504
1301 005220 066704 000066
1302 005224 005502
1303 005226 062700 001057
1304 005232 005504
1305 005234 005502
1306 005236 062704 047401
1307 005242 005502
1308 005244 062702 000006
1309 005250 062700 000002
1310 005254 005504
1311 005256 010067 000026
1312 005262 010021
1313 005264 005367 173622
1314 005270 001406
1315 005272 010467 000014
1316 005276 010421
1317 005300 005367 173606
1318 005304 001326
1319 005306 000205
1320 005310 000000
1321 005312 000000

```

;RANDOM DATA GENERATOR SUBROUTINE

```

RANDOM: MOV LONUM,%0 ;SET UP R0 WITH 5 DIGITS LOW
        MOV HINUM,%4 ;SET UP R1 WITH 5 DIGITS HIGH
        MOV #7,%3 ;SET UP SHIFT COUNT
        CLR %2 ;CLEAR R2
SHIFT:  ASL %0 ;SHIFT R0 LEFT AND
        ROL %4 ;ROTATE CARRY INTO LSB OF R1 INTO
        ROL %2 ;ROTATE CARRY OUT OF R1 INTO R2
        DEC %3 ;DECREMENT R3
        BNE SHIFT ;CONTINUE SHIFT LOOP
        ADD LONUM,%0 ;ADDN IN NUMBER TO MAKE X 129
        ADC %4 ;PROPOGATE CARRY
        ADD HINUM,%4 ;ADDN IN NUMBER TO MAKE X 129
        ADC %2 ;PROPOGATE CARRY
        ADD #1057,%0 ;ADDN LOW CONSTANT
        ADC %4 ;PROPOGATE CARRIES
        ADC %2 ;PROPOGATE AGAIN
        ADD #47401,%4 ;ADDN HIGH CONSTANT
        ADC %2 ;PROPOGATE CARRY
        ADD #6,%2 ;ADDN HIGHEST CONSTANT
        ADD #2,%0 ;REPRIME R0 WITH HIGH DIGIT
        ADC %4 ;PROPOGATE CARRY
        MOV %0,LONUM ;PUT R0 BACK IN LONUM
        MOV %0,(1)+ ;HOLD LONUM FOR PROGRAM
        DEC WORK
        BEQ EXGEN
        MOV %4,HINUM ;PUT R1 BACK IN HINUM
        MOV %4,(1)+ ;HOLD HINUM FOR PROGRAM
        DEC WORK
        BNE RANDOM
EXGEN:  RTS %5 ;RETURN TO PROGRAM
LONUM:  0
HINUM:  0

```

1322  
1323  
1324 005314 000000  
1325 005316 177777  
1326 005320 134510  
1327 005322 043267  
1328 005324 100000  
1329 005326 107070  
1330 005330 070707  
1331 005332 052525  
1332 005334 125252  
1333 005336 177737  
1334 005340 004102  
1335 005342 136363  
1336 005344 063636  
1337 005346 000001  
1338 005350 100005  
1339 005352 000520  
1340 005354 030303  
1341  
1342  
1343  
1344  
1345  
1346  
1347 005356 005067 173534  
1348 005362 005067 173526  
1349 005366 016767 173462 173516  
1350 005374 012767 000040 173502  
1351 005402 012767 011432 173462  
1352 005410 016767 173474 173456  
1353 005416 027777 173450 173450  
1354 005424 001030  
1355 005426 005267 173464  
1356 005432 005267 173456  
1357 005436 026767 173406 173452  
1358 005444 001417  
1359 005446 036767 173432 173440  
1360 005454 001404  
1361 005456 005267 173430  
1362 005462 005067 173426  
1363 005466 062767 000002 173376  
1364 005474 062767 000002 173372  
1365 005502 000745  
1366 005504 000205

;RC11 DATA PATTERNS

PAT0: 0  
PAT1: 177777  
PAT2: 134510  
PAT3: 043267  
PAT4: 100000  
PAT5: 107070  
PAT6: 070707  
PAT7: 052525  
PAT10: 125252  
PAT11: 177737  
PAT12: 004102  
PAT13: 136363  
PAT14: 063636  
PAT15: 000001  
PAT16: 100005  
PAT17: 000520  
PAT20: 030303  
;PAT21 RANDOM DATA

;DATA COMPARISON ROUTINE  
;IF AN ERROR OCCURS BETWEEN THE OUT-BUFFER AND  
;THE IN-BUFFER AN ERROR WILL BE REPORTED IN THE

COMPARE: CLR WORK2 ;WORD COUNT  
CLR WORK1  
MOV DMA, WORK  
MOV #40, BLOCK ;LO DENSITY DRIVE  
MOV #OUTBUF, SAVE ;SET UP OUTBUFFER POINTER  
MOV INBUF, SAV1 ;SET UP IN BUFFER POINTER  
WRDCMP: CMP @SAVE, @SAV1 ;COMPARE BUFFERS  
BNE WDERR ;WORD IN ERROR  
WRDINC: INC WORK2 ;+1 WORD COUNT  
INC WORK1  
CMP WRDCT, WORK2 ;IS COMPLETE BUFFER CHECKED  
BEQ ADAM ;EXIT ROUTINE  
BIT BLOCK, WORK1  
BEQ BLAD1  
BALDIX: INC WORK  
CLR WORK1  
BLAD1: ADD #2, SAVE  
ADD #2, SAV1  
BR WRDCMP ;COMPARE NEXT WORD  
ADAM: RTS %S ;EXIT THIS ROUTINE

K03

MAINDEC-11-DZRCB-B  
DZRCBB.P11

RC11 DATA TEST REPLACES D5JA-PB2/DZRCB-A

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|      |        |        |        |        |        |       |               |                             |
|------|--------|--------|--------|--------|--------|-------|---------------|-----------------------------|
| 1367 | 005506 | 052767 | 001000 | 173330 | WDERR: | BIS   | #BIT9,FLAG    | ;SET ERROR BIT              |
| 1368 | 005514 | 004567 | 001300 |        |        | JSR   | %5,CONV       | ;CONVERT WORD ADDR TO ASCII |
| 1369 | 005520 | 001112 |        |        |        | WORK  |               |                             |
| 1370 | 005522 | 010435 |        |        |        | MES1  |               |                             |
| 1371 | 005524 | 000006 |        |        |        | 6     |               |                             |
| 1372 | 005526 | 004567 | 001266 |        |        | JSR   | %5,CONV       |                             |
| 1373 | 005532 | 001114 |        |        |        | WORK1 |               |                             |
| 1374 | 005534 | 010543 |        |        |        | MES4  |               |                             |
| 1375 | 005536 | 000002 |        |        |        | 2     |               |                             |
| 1376 | 005540 | 017767 | 173326 | 001332 |        | MOV   | ASAVE,ACNVX   | ;FETCH GOOD DATA            |
| 1377 | 005546 | 004567 | 001246 |        |        | JSR   | %5,CONV       | ;CONVERT GOOD DATA TO ASCII |
| 1378 | 005552 | 007100 |        |        |        | ACNVX |               |                             |
| 1379 | 005554 | 010563 |        |        |        | MES5X |               |                             |
| 1380 | 005556 | 000006 |        |        |        | 6     |               |                             |
| 1381 | 005560 | 017767 | 173310 | 001312 |        | MOV   | ASAV1,ACNVX   | ;FETCH BAD DATA             |
| 1382 | 005566 | 004567 | 001226 |        |        | JSR   | %5,CONV       | ;CONVERT TO ASCII           |
| 1383 | 005572 | 007100 |        |        |        | ACNVX |               |                             |
| 1384 | 005574 | 010575 |        |        |        | MES6X |               |                             |
| 1385 | 005576 | 000006 |        |        |        | 6     |               |                             |
| 1386 | 005600 | 016767 | 173240 | 001272 |        | MOV   | FLAG,ACNVX    | ;WHICH READ THE             |
| 1387 | 005606 | 042767 | 177774 | 001264 |        | BIC   | #177774,ACNVX | ;ERROR OCCURRED ON          |
| 1388 | 005614 | 004567 | 001200 |        |        | JSR   | %5,CONV       |                             |
| 1389 | 005620 | 007100 |        |        |        | ACNVX |               |                             |
| 1390 | 005622 | 010625 |        |        |        | MES13 |               |                             |
| 1391 | 005624 | 000001 |        |        |        | 1     |               |                             |
| 1392 | 005626 | 104000 |        |        |        | EMT   | +0            | ;PRINT MESSAGE              |
| 1393 | 005630 | 010306 |        |        |        | HED1  |               |                             |
| 1394 | 005632 | 010625 |        |        |        | MES13 |               |                             |
| 1395 | 005634 | 010435 |        |        |        | MES1  |               |                             |
| 1396 | 005636 | 010543 |        |        |        | MES4  |               |                             |
| 1397 | 005640 | 010560 |        |        |        | MES5  |               |                             |
| 1398 | 005642 | 010572 |        |        |        | MES6  |               |                             |
| 1399 | 005644 | 177777 |        |        |        | -1    |               |                             |
| 1400 | 005646 | 032777 | 002000 | 173124 |        | BIT   | #BIT10,ASWR   | ;HALT ON ERROR              |
| 1401 | 005654 | 001401 |        |        |        | BEQ   | .+4           |                             |
| 1402 | 005656 | 000000 |        |        |        | HALT  |               | ;YES HALT BIT 10 SET IN SWR |
| 1403 | 005660 | 000662 |        |        |        | BR    | WRDINC        | ;GO COMPARE NEXT WORD       |

```

1404 ;EXTENDED MEMORY EXERCISER
1405 ;THE PROGRAM DETERMINES HOW MUCH MEMORY
1406 ;IS ON THE SYSTEM THEN IT
1407 ;GENERATES A RANDOM BUFFER THAT SIZE
1408 ;AND WRITES AND WRITE CHECKS THE DATA
1409
1410 005662 012777 000340 173112 EXTMEN: MOV #340,APS ;LOCK UP PRIORITY LEVELS
1411 005670 013767 000042 173174 MOV #42,SAVE ;GET MONITOR ADDRESS
1412 005676 001410 BEQ IS ;SKIP IF 0
1413 005700 100432 BMI LGMEM ;GREATER THAN 16K
1414 005702 162767 000020 173162 SUB #20,SAVE ;DEC IT
1415 005710 022767 011432 173154 CMP #OUTBUF,SAVE ;IS IT ACT11?
1416 005716 100432 BMI GOTMEM ;NO - SKIP
1417 005720 012767 005776 172056 IS: MOV #MAXREF,4 ;SET UP I/O BUS TRAP
1418 005726 012767 000340 172052 MOV #340,6
1419 005734 012767 017446 173130 MOV #17446,SAVE ;SET UP FOR 4K
1420 005742 005777 173124 EXREF: TST ASAVE ;REFERENCE MEMORY
1421 005746 022767 177446 173116 CMP #177446,SAVE ;TEST FOR GREATER THAN 28K
1422 005754 001410 BEQ MAXREF ;LAST REFERENCE MADE TO I/O REG.
1423 005756 062767 020000 173106 ADD #20000,SAVE ;SET UP FOR NEXT MEMORY REF.
1424 005764 000766 BR EXREF ;GO REFERENCE MEMORY
1425 005766 162767 000024 173076 LGMEM: SUB #24,SAVE ;DEC IT
1426 005774 000403 BR GOTMEM
1427
1428 ;ENTER HERE WHEN I/O BUS ERROR OCCURS
1429
1430 005776 162767 020000 173066 MAXREF: SUB #20000,SAVE
1431 006004 012767 000006 171772 GOTMEM: MOV #6,4 ;RESTORE I/O BUS TRAP
1432 006012 005067 171770 CLR 6
1433 006016 162767 011432 173046 SUB #OUTBUF,SAVE ;SET UP NEW WORD COUNT
1434 006024 006067 173042 ROR SAVE
1435 006030 016767 173036 173012 MOV SAVE,WRDCT ;
1436 006036 042767 000001 173026 BIC #BIT0,SAVE
1437 006044 012767 011432 173036 MOV #OUTBUF,INBUF
1438 006052 066767 173014 173030 ADD SAVE,INBUF
1439 006060 006067 172754 ROR WRDCT
1440 006064 042767 000037 172756 BIC #37,WRDCT
1441 006072 004767 176722 JSR %7,BLSZ
1442 006076 000241 BUFOK: CLC
1443 006100 006167 173000 ROL BLOCK
1444 006104 006167 172774 ROL BLOCK
1445 006110 006167 172770 ROL BLOCK
1446 006114 006167 172764 ROL BLOCK
1447 006120 006167 172760 ROL BLOCK
1448 006124 016767 172754 172734 MOV BLOCK,SWRDCT
1449 006132 000205 RTS %5

```

```

1450 ;BACKGROUND TEST FOR INTERRUPTS
1451
1452 006134 012767 006262 171652 XWAIT: MOV #RTIX,14 ;SET UP TRACE TRAP
1453 006142 005067 171650 CLR 16
1454 006146 012737 006170 000010 MOV #1$,@#10 ;SET ILL INST.
1455 006154 006727 000000 SXT #0 ;TEST FOR 11/45
1456 006160 012767 000006 000074 MOV #6,RTIX ;MAKE IT AN RTT
1457 006166 000401 BR 2$ ;SKIP JUNK
1458 006170 022626 1$: CMP (6)+,(6)+ ;CLEAR STACK
1459 006172 012737 000012 000010 2$: MOV #12,@#10 ;RESET 10
1460 006200 005067 172672 CLR PASS ;SET UP TIME BASE
1461 006204 012746 000020 MOV #BIT4,-(6) ;SET TRACE TRAP BIT
1462 006210 012746 006216 MOV #.+6,-(6)
1463 006214 000002 RTI ;RETURNS TO NEXT LOC WITH T BIT SET
1464 006216 005027 000000 CLR #0
1465 006222 005267 177772 XINCW: INC XINCW-2
1466 006226 105767 177766 TSTB XINCW-2
1467 006232 100373 BPL XINCW
1468 006234 005267 172636 INC PASS
1469 006240 001401 BEQ .+4
1470 006242 000765 BR XINCW-4
1471 ;REPORT BACKGROUND TEST TIMED OUT
1472 006244 005046 CLR -(6) ;CLEAR PS ON STACK
1473 006246 012746 006254 MOV #1$,-(6) ;SET RETURN
1474 006252 000002 RTI ;CLEAR TRACE BIT
1475 006254 104001 1$: EMT+1
1476 006256 010642 TIMO
1477 006260 000000 HALT
1478 006262 000002 RTIX: RTI
1479
1480 ;ROUTINE TO ALLOW THE OPERATOR TO SET BITS
1481 ;THIS ROUTINE ENABLES THE OPERATOR TO SELECT A TRACK STATICLY
1482 ;THE ROUTINE DOES A ONE WORD READ TO SELECT THE TRACK
1483 ;THE OPERATOR MAY CHANGE THE SWITCH REGISTER AT ANY TIME
1484 ;SWR4-0 EQUALS THE TRACK NUMBER
1485 ;SWR6-5 EQUALS THE DISK NUMBER
1486
1487 006264 017767 172510 172622 TKSEL: MOV @SWR,WORK1 ;FETCH SWR
1488 006272 017767 172502 172616 MOV @SWR,WORK2
1489 006300 042767 177600 172606 BIC #177600,WORK1 ;MASK DISK AND TRACK NO.
1490 006306 016767 172602 172576 MOV WORK1,WORK
1491 006314 000241 CLC
1492 006316 006167 172570 ROL WORK
1493 006322 006167 172564 ROL WORK
1494 006326 006167 172560 ROL WORK
1495 006332 006167 172554 ROL WORK
1496 006336 006167 172550 ROL WORK
1497 006342 006167 172544 ROL WORK
1498 006346 016777 172540 172454 MOV WORK,@RCDA ;DISK ADDRESS LOADED
1499 006354 016777 172530 172444 MOV INBUF,@RCBA ;LOAD CURRENT ADDRESS
1500 006362 012777 177777 172434 MOV #177777,@RCWC ;LOAD WORD COUNT
1501 006370 012777 000005 172424 MOV #5,@RCCS ;GO AND READ
1502 006376 105777 172420 TSTB @RCCS ;TEST FOR READY
1503 006402 100375 BPL .-4
1504 006404 026777 172506 172366 SRCHG: CMP WORK2,@SWR
1505 006412 001324 BNE TKSEL ;SWR HAS CHANGED

```

N03.

MAINDEC-11-DZRCB-B  
DZRCBB.P11

RC11 DATA TEST REPLACES DSJA-PB2/DZRCB-A

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1506 006414 000773

BR SRCHG

;LOOP ON SAME ADDR

```

1507 ;ROUTINE TO REPORT ERROR COUNT AND CONTENTS OF ONE REGISTER
1508
1509 006416 004567 000376 STAER: JSR %5, CONV ; CONVERT OCTAL TO ASCII
1510 006422 001112 WORK ; DATA TO BE CONVERTED
1511 006424 010575 MES6X ; ADDRESS OF MESSAGE
1512 006426 000006 6
1513 006430 004567 000364 JSR %5, CONV ; CONVERT OCTAL TO ASCII
1514 006434 001070 ERCOUNT
1515 006436 010401 HEDSX ; ADDRESS OF MESSAGE
1516 006440 000001 1
1517 006442 104000 EMT +0 ; REPORT MESSAGE
1518 006444 010372 HEDS
1519 006446 010572 MES6
1520 006450 177777 -1
1521 006452 004767 001572 JSR %7, INCTAB ; INCREMENT ERROR COUNT
1522 006456 000426 BR STAERX
1523
1524 ;ROUTINE TO REPORT ERROR COUNT AND THE CONTENTS OF TWO REGISTERS
1525
1526 006460 004567 000334 STAER1: JSR %5, CONV ; CONVERT OCTAL TO ASCII
1527 006464 001112 WORK ; DATA TO BE CONVERTED
1528 006466 010575 MES6X ; ADDRESS OF MESSAGE
1529 006470 000006 6
1530 006472 004567 000322 JSR %5, CONV ; CONVERT OCTAL TO ASCII
1531 006476 001114 WORK1 ; DATA TO BE CONVERT
1532 006500 010563 MESSX ; ADDRESS OF MESSAGE
1533 006502 000006 6
1534 006504 004567 000310 JSR %5, CONV ; CONVERT OCTAL TO ASCII
1535 006510 001070 ERCOUNT
1536 006512 010401 HEDSX ; ADDRESS OF MESSAGE
1537 006514 000001 1
1538 006516 104000 EMT +0 ; REPORT MESSAGE
1539 006520 010372 HEDS
1540 006522 010563 MESS
1541 006524 010572 MES6
1542 006526 177777 -1
1543 006530 004767 001514 JSR %7, INCTAB ; INCREMENT ERROR COUNT
1544 006534 032777 002000 1722'S STAERX: BIT #BIT10, JSWR
1545 006542 001401 BEQ .+4
1546 006544 000000 HALT
1547 006546 000205 RTS %5 ; EXIT ROUTINE
1548
1549
1550 ;ROUTINE TO DECODE EMT CALLS
1551 ;EMT+1=TYPE ONE LINE OF TEXT
1552 ;EMT+0=TYPE A SERIES OF LINES
1553 006550 011600 104001 EMTRP: MOV (6), %0
1554 006552 022740 CMP #EMT+1, -(0) ; WAS THE CALL EMT+1
1555 006556 001103 BNE TYP ; NO! TYPE A SERIES OF LINES OF TEXT
1556 006560 000400 BR TYP ; YES TYPE ONE LINE OF TEXT

```

```

1557 ;SUBROUTINE TO OUTPUT ASCII MESSAGES ON THE TTY
1558
1559 006562 011600 TYP: MOV 3%6,%0 ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS
1560 006564 062716 000002 ADD #2,3%6 ;SET UP EXIT.
1561 006570 011000 MOV 3%0,%0 ;ADDRESS OF MESSAGE TO RO.
1562 006572 112067 000164 TYP A: MOV B (0)+,TYPDAT ;GET CHARACTER
1563 006576 122767 000100 000156 CMP B #100,TYPDAT ;CHECK FOR "3" CHARACTER
1564 006604 001005 BNE TYP C ;BRANCH IF NOT "3".
1565 006606 005067 000150 CLR TYP DAT ;OUTPUT NULL TO
1566 006612 004767 000030 JSR %7,TYP D ;CLEAR BUFFER
1567 006616 000002 RTI ;TERMINATOR CHAR. DONE. EXIT.
1568 006620 122767 000045 000134 TYP C: CMP B #45,TYPDAT ;CHECK FOR "%".
1569 006626 001442 BEQ TYP F ;BRANCH IF "%".
1570 006630 122767 000042 000124 CMP B #42,TYPDAT ;NOT "%". CHECK FOR "8".
1571 006636 001443 BEQ TYP G ;BRANCH IF "8".
1572 006640 004767 000002 JSR %7,TYP D ;TYPE CHAR IN TYPDAT
1573 006644 000752 BR TYP A
1574 006646 032777 040000 172124 TYP D: BIT #BIT14,%SWR
1575 006654 001026 BNE TYP EXIT
1576 006656 116777 000100 172120 MOV B TYP DAT,%TPB ;OUTPUT CHARACTER TO PRINTER
1577 006664 105777 172120 TST B %TPS ;WAIT FOR DONE FLAG.
1578 006670 100375 BPL -4
1579 006672 122767 000015 000062 CMP B #15,TYPDAT ;CHECK FOR CR
1580 006700 001003 BNE 15 ;NO-SKIP
1581 006702 012767 000011 000054 15: MOV #9, NULL ;SET NULL COUNTER
1582 006710 005767 000050 TST NULL ;TEST COUNTER
1583 006714 001406 BEQ TYP EXIT ;ZERO-EXIT
1584 006716 005367 000042 DEC NULL ;DECREMENT
1585 006722 112767 000000 000032 MOV B #0,TYPDAT ;ZERO OUTPUT
1586 006730 000746 BR TYP D ;OUTPUT NULL
1587 006732 000207 TYP EXIT: RTS %7 ;EXIT
1588 006734 112767 000015 000020 TYP F: MOV B #15,TYPDAT ;MOVE CARRIAGE RETURN CODE TO TYPDAT
1589 006742 004767 177700 JSR %7,TYP D ;GO TYPE CHAR.
1590 006746 112767 000012 000006 TYP G: MOV B #12,TYPDAT ;MOVE LF CODE TO TYPDAT.
1591 006754 004767 177666 JSR %7,TYP D ;GO TYPE CHAR.
1592 006760 000704 BR TYP A
1593 006762 000000 TYP DAT: 0
1594 006764 000000 NULL: 0

```

```

1595 ;SUBROUTINE TO OUTPUT A SERIES OF ASCII MESSAGES ON TELETYPE PRINTER
1596 006766 011600 TYP S: MOV 3%6,%0 ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS
1597 006770 062716 000002 ADD #2,3%6 ;UPDATE TO NEXT MESSAGE ADDRESS
1598 006774 011067 000014 MOV 3%0,TYP SB ;ADDRESS OF MESSAGE TO TYP SB
1599 007000 022767 177777 000006 CMP #1,TYP SB ;CHECK FOR TERMINATOR
1600 007006 001001 BNE TYP SA ;BRANCH IF NOT TERMINATOR.
1601 007010 000002 RTI ;TERMINATOR. EXIT
1602 007012 104001 TYP SA: EMT +1 ;CALL ON TYP SUB TO TYPE MESSAGE
1603 007014 000000 TYP SB: 0 ;ADDRESS OF MESSAGE GOES HERE
1604 007016 000763 BR TYP S ;GO PROCESS NEXT MESSAGE

```

```

1605
1606 ;OCTAL TO ASCII CONVERT ROUTINE
1607
1608 ;ENTER ROUTINE AS FOLLOWS
1609 ;JSR%5,CONV
1610 ;ADDR#=ADDRESS OF NUMBER TO BE CONVERTED
1611 ;ADDR BYTE=LSB OF WHERE ASCII IS GOING
1612

```

D04

MAINDEC-11-DZRCB-B  
DZRCBB.P11

RC11 DATA TEST REPLACES DSJA-PB2/DZRCB-A

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|      |        |        |        |
|------|--------|--------|--------|
| 1613 |        |        |        |
| 1614 |        |        |        |
| 1615 | 007020 | 013567 | 000054 |
| 1616 | 007024 | 012501 |        |
| 1617 | 007026 | 012502 |        |
| 1618 | 007030 | 060201 |        |

:ASCII#=THE NUMBER OF ASCII CHAR. TO BE CONVERTED

|       |     |             |                             |
|-------|-----|-------------|-----------------------------|
| CONV: | MOV | 2(5)+,ACNVX | :VALUE OF # TO BE CONVERTED |
|       | MOV | (5)+,%1     | :ASCII ADDR                 |
|       | MOV | (5)+,%2     | :# OF ASCII CHAR            |
|       | ADD | %2,%1       |                             |

|      |        |        |        |        |         |      |              |                                    |
|------|--------|--------|--------|--------|---------|------|--------------|------------------------------------|
| 1619 | 007032 | 016703 | 000042 |        | ACVN:   | MOV  | ACNVX,%3     |                                    |
| 1620 | 007036 | 042703 | 177770 |        |         | BIC  | #177770,%3   | ; ISOLATE LEAST SIGNIFICANT OCTAL# |
| 1621 | 007042 | 062703 | 000060 |        |         | ADD  | #60,%3       | ; SET UP ASCII#                    |
| 1622 | 007046 | 110341 |        |        |         | MOVB | %3,-(1)      | ; STORE ASCII CHAR                 |
| 1623 | 007050 | 042767 | 000007 | 000022 |         | BIC  | #7,ACNVX     |                                    |
| 1624 | 007056 | 006067 | 000016 |        |         | ROR  | ACNVX        | ; ROTATE OCTAL#                    |
| 1625 | 007062 | 006067 | 000012 |        |         | ROR  | ACNVX        |                                    |
| 1626 | 007066 | 006067 | 000006 |        |         | ROR  | ACNVX        |                                    |
| 1627 | 007072 | 005302 |        |        |         | DEC  | %2           | ; -1 FROM ASCII CHAR COUNT         |
| 1628 | 007074 | 001356 |        |        |         | BNE  | ACVN         |                                    |
| 1629 | 007076 | 000205 |        |        |         | RTS  | %5           | ; EXIT # CONVERTED                 |
| 1630 | 007100 | 000000 |        |        | ACNVX:  | 0    |              | ; WORK REGISTER                    |
| 1631 |        |        |        |        |         |      |              |                                    |
| 1632 |        |        |        |        |         |      |              |                                    |
| 1633 |        |        |        |        |         |      |              |                                    |
| 1634 |        |        |        |        |         |      |              |                                    |
| 1635 | 007102 | 012767 | 000040 | 001174 | NOCHA:  | MOV  | #40,TSTCH    | ; SET UP FOR NUM. CHAR.            |
| 1636 | 007110 | 000403 |        |        |         | BR   | TYST         |                                    |
| 1637 | 007112 | 012767 | 000100 | 001164 | ALPHA:  | MOV  | #100,TSTCH   | ; SET UP FOR ALPHA CHAR            |
| 1638 | 007120 | 012777 | 000340 | 171654 | TYST:   | MOV  | #340,APS     | ; LOCK UP INTERRUPTS               |
| 1639 | 007126 | 005067 | 001150 |        |         | CLR  | TEXBUF       | ; CLEAR TEXT BUFFER REG            |
| 1640 | 007132 | 105777 | 171654 |        | TSTFLG: | TSTB | @TKS         | ; CHECK FOR FLAG                   |
| 1641 | 007136 | 100375 |        |        |         | BPL  | TSTFLG       |                                    |
| 1642 | 007140 | 017777 | 171642 | 171636 |         | MOV  | @TKB,@TPB    | ; CHARACTER IN BUFFER              |
| 1643 | 007146 | 105777 | 171636 |        |         | TSTB | @TPS         | ; ECHO CHARACTER                   |
| 1644 | 007152 | 100375 |        |        |         | BPL  | .-4          |                                    |
| 1645 | 007154 | 022777 | 000377 | 171624 |         | CMP  | #377,@TKB    | ; CHECK FOR RUB-OUT                |
| 1646 | 007162 | 001014 |        |        |         | BNE  | CKCH         | ; EXIT IF NOT RUB-OUT              |
| 1647 | 007164 | 104001 |        |        |         | EMT  | +1           |                                    |
| 1648 | 007166 | 010606 |        |        |         | MESB |              | ; REPORT RUB-OUT ACKNOWLEDGED      |
| 1649 | 007170 | 042767 | 000007 | 001104 |         | BIC  | #7,TEXBUF    |                                    |
| 1650 | 007176 | 006067 | 001100 |        |         | ROR  | TEXBUF       |                                    |
| 1651 | 007202 | 006067 | 001074 |        |         | ROR  | TEXBUF       |                                    |
| 1652 | 007206 | 006067 | 001070 |        |         | ROR  | TEXBUF       |                                    |
| 1653 | 007212 | 000747 |        |        |         | BR   | TSTFLG       | ; GO WAIT FOR NEW CHAR.            |
| 1654 | 007214 | 022777 | 000215 | 171564 | CKCH:   | CMP  | #215,@TKB    | ; CHECK FOR CARRIAGE RETURN        |
| 1655 | 007222 | 001001 |        |        |         | BNE  | .-+4         |                                    |
| 1656 | 007224 | 000207 |        |        |         | RTS  | %7           | ; EXIT DELIMITER TYPED             |
| 1657 | 007226 | 036777 | 001052 | 171552 |         | BIT  | TSTCH,@TKB   |                                    |
| 1658 | 007234 | 001003 |        |        |         | BNE  | CHOK         |                                    |
| 1659 | 007236 | 104001 |        |        |         | EMT  | +1           | ; REPORT QUESTION MARK             |
| 1660 | 007240 | 010604 |        |        |         | MES7 |              |                                    |
| 1661 | 007242 | 000733 |        |        |         | BR   | TSTFLG       | ; WAIT FOR CORRECT CHAR.           |
| 1662 | 007244 | 017767 | 171536 | 171640 | CHOK:   | MOV  | @TKB,WORK    |                                    |
| 1663 | 007252 | 042767 | 177770 | 171632 |         | BIC  | #177770,WORK |                                    |
| 1664 | 007260 | 000241 |        |        |         | CLC  |              |                                    |
| 1665 | 007262 | 006167 | 001014 |        |         | ROL  | TEXBUF       |                                    |
| 1666 | 007266 | 000241 |        |        |         | CLC  |              |                                    |
| 1667 | 007270 | 006167 | 001006 |        |         | ROL  | TEXBUF       |                                    |
| 1668 | 007274 | 000241 |        |        |         | CLC  |              |                                    |
| 1669 | 007276 | 006167 | 001000 |        |         | ROL  | TEXBUF       |                                    |
| 1670 | 007302 | 066767 | 171604 | 000772 |         | ADD  | WORK,TEXBUF  | ; ADD CHARACTER                    |
| 1671 | 007310 | 000710 |        |        |         | BR   | TSTFLG       | ; WAIT FOR NEW CHARACTER           |

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1672
1673
1674
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1679
1680
1681
1682
1683
1684 007312 012706 001000
1685 007316 004767 000374
1686 007322 005067 171526
1687 007326 005067 171520
1688 007332 012767 007322 171542
1689 007340 012767 007470 170456
1690 007346 012767 000340 170452
1691 007354 104503
1692 007356 032777 001000 171414
1693 007364 001002
1694 007366 000004
1695 007370 000404
1696 007372 016777 171444 171402
1697 007400 000001
1698 007402 004767 175004
1699 007406 000762
1700 007410 000744
1701
1702
1703
1704 007412 005067 171436
1705 007416 005067 171430
1706 007422 012767 007412 171452
1707 007430 104507
1708 007432 032777 001000 171340
1709 007440 001002
1710 007442 000004
1711 007444 000404
1712 007446 016777 171370 171326
1713 007454 000001
1714 007456 004767 174730
1715 007462 000762
1716 007464 000167 177632
1717
    
```

```

;RC11 POWER FAIL TEST #1
;DISK ZERO
;WRITE COMPLETE DISK WITH 125252 PATTERN
;REPORT "OK"
;START WRITING THE SAME PATTERN
;WHEN POWER FAIL OCCURS ABORT TRANSFER
;SETUP NEW ENTRY POINT AND HALT

;POWER UP AND WRITE CHECK THE DISK FOR ERRORS

;***ONLY ONE ERROR IS CONSIDERED ACCEPTABLE***

PFT1:  MOV    #1000,%6      ;SET UP STACK
        JSR    %7,POWFAL   ;WRITE 125252 ON DISK
PFWAT:  CLR    DMA
        CLR    TRACK
        MOV    #PFWAT,HRDR  ;SET UP FOR HARD ERROR
        MOV    #DOWN,24    ;SET UP POWER FAIL VEC.
        MOV    #340,26
MYBYWR: WRITE +100
        BIT    #BIT9,2SWR
        BNE    .+6
        IOT
        BR     .+12
        MOV    PRIORITY,2PS
        WAIT
        JSR    %7,DISBUF   ;SET UP NEW DISK BUFFER
        BR    MYBYWR
        BR    PFWAT

;ROUTINE TO CHECK DATA AFTER POWER FAIL

UPCHK:  CLR    DMA
        CLR    TRACK
        MOV    #UPCHK,HRDR  ;SET UP FOR HARD ERROR
CHKDAT:  WRCHECK +100
        BIT    #BIT9,2SWR
        BNE    .+6
        IOT
        BR     .+12
        MOV    PRIORITY,2PS
        WAIT
        JSR    %7,DISBUF   ;SET UP NEW DISK BUFFER
        BR    CHKDAT
        JMP    PFWAT      ;GO WAIT FOR ANOTHER
                          ;POWER FAIL
    
```

```

1718 ;POWER DOWN ROUTINE
1719 ;ABORT DISK AND HALT
1720
1721 007470 052777 000400 171324 DOWN: BIS #BIT8,DRCCS ;ABORT DISK
1722 007476 012767 007506 170320 MOV #UP,24 ;SET POWER FAIL VECTOR
1723 007504 000000 HALT
1724
1725 007506 012767 007470 170310 UP: MOV #DOWN,24
1726 007514 012706 001000 MOV #1000,%6
1727 007520 012767 177324 171364 MOV #-300.,WORK ;SET UP TWENTY SECOND TIMER
1728 007526 000005 TIMCNT: RESET
1729 007530 005267 171356 INC WORK ;+1 TIMER
1730 007534 001374 BNE TIMCNT ;TWO SECONDS NOT UP GO WAIT
1731 007536 104001 EMT +1 ;REPORT PWR FAIL
1732 007540 010702 PWRF
1733 007542 000167 177644 JMP UPCHK ;GO CHECK DISK
1734
1735
1736 ;POWER FAIL TEST #2
1737 ;DISK ZERO
1738 ;WRITE COMPLETE DISK WITH 125252 PATTERN
1739 ;REPORT "OK"
1740 ;WRITE CHECK DISK AND WAIT FOR POWER FAIL
1741 ;WHEN POWER COMES BACK WRITE CHECK DISK AGAIN
1742 ;AND CHECK FOR ERRORS
1743 ;***NO ERRORS SHOULD OCCUR.***
1744
1745 ;DO NOT CREATE ANOTHER POWER FAIL UNTIL
1746 ;THE ADDRESS REGISTER HAS COMPLETELY CYCLED
1747 ;THROUGH.
1748
1749 007546 012706 001000 PFT2: MOV #1000,%6 ;SET UP STACK
1750 007552 004767 000140 JSR %7,POWFAL ;WRITE 125252 ON DISK
1751 007556 005067 171272 PWRFL: CLR DMA
1752 007562 005067 171264 CLR TRACK
1753 007566 012767 007556 171306 MOV #PWRFL,HRDR ;SET UP HARD ERROR
1754 007574 012767 007646 170222 MOV #PWRDN,24 ;SET UP POWER FAIL VEC.
1755 007602 012767 000340 170216 MOV #340,26
1756 007610 104507 CHKDSK: WRCHECK +100
1757 007612 032777 001000 171160 BIT #BIT9,DSWR
1758 007620 001002 BNE .+6
1759 007622 000004 IOT ;WAIT IN BACKGROUND
1760 007624 000404 BR .+12
1761 007626 016777 171210 171146 MOV PRIORITY,APS
1762 007634 000001 WAIT
1763 007636 004767 174550 JSR %7,DISBUF ;CHECK NEXT BUFFER
1764 007642 000762 BR CHKDSK
1765 007644 000744 BR PWRFL

```

```

1766 ;ROUTINE TO ABORT DISK DURING POWER FAIL
1767
1768 007646 052777 000400 171146 PWRDN: BIS #BIT8,DRCCS ;CLEAR THE DISK
1769 007654 012767 007664 170142 MOV #PWRL,24 ;SET UP RESTART
1770 007662 000000 HALT
1771
1772 007664 012767 007646 170132 PWRUP: MOV #PWRDN,24 ;RESET POWER FAIL VECTOR
1773 007672 012706 001000 MOV #1000,%6
1774 007676 012767 177324 171206 MOV #-300.,WORK ;SET UP TWENTY SECOND TIMER
1775 007704 000005 XTIMCNT: RESET
1776 007706 005267 171200 INC WORK ;+1 TIMER
1777 007712 001374 BNE XTIMCNT ;TWO SECONDS NOT UP GO WAIT
1778 007714 000720 BR PWRFL ;GO CHECK DISK
1779
1780
1781 ;ROUTINE TO WRITE THE COMPLETE DISK
1782 ;WITH 125252 PATTERN
1783 ;WRITE CHECK AND REPORT ERRORS IF THEY
1784 ;OCCUR
1785 ;REPORT "OK" AT COMPLETION
1786
1787 007716 011667 171164 POWFAL: MOV (6),PASSC
1788 007722 012706 001000 MOV #1000,%6
1789 007726 012767 000020 171122 MOV #20,PATNU ;SET UP PATTERN
1790 007734 005067 171114 CLR DMA
1791 007740 005067 171106 CLR TRACK
1792 007744 012767 002000 171114 MOV #2000,SWRDCT ;SETUP WORD COUNT
1793 007752 016767 171110 171070 MOV SWRDCT,WRDCT
1794 007760 004567 175136 JSR %5,PASEL ;GENERATE DATA BUFFER
1795 007764 012767 011432 171066 MOV #OUTBUF,BUF ;SET UP CURRENT ADDRESS
1796 007772 012767 007716 171102 MOV #POWFAL,HRDR
1797 010000 104503 WRDNW: WRITE +100
1798 010002 032777 001000 170770 BIT #BIT9,DSWR ;CHECK ON HOW TO WAIT
1799 010010 001002 BNE .+6
1800 010012 000004 IOT ;BACKGROUND TEST
1801 010014 000404 BR .+12
1802 010016 016777 171020 170756 MOV PRIORITY,APS
1803 010024 000001 WAIT
1804 010026 104507 WRCHECK +100
1805 010030 032777 001000 170742 BIT #BIT9,DSWR
1806 010036 001002 BNE .+6
1807 010040 000004 IOT
1808 010042 000404 BR .+12
1809 010044 016777 170772 170730 MOV PRIORITY,APS
1810 010052 000001 WAIT
1811 010054 004767 174332 JSR %7,DISBUF ;SET UP NEW DISK BUFFER
1812 010060 000747 BR WRDNW ;WRITE NEW BUFFER
1813 010062 104001 EMT +1
1814 010064 010635 OK
1815 010066 000177 171014 JMP @PASSC
1816
1817 ;ROUTINE TO SET ACTION ENABLE ON MA/MF PARITY MEMORIES
1818 ;CALL JSR PC,MANF
1819 172100 PARCSR= 172100
1820 000114 PARVEC= 114
1821 000004 ERRVEC= 4

```

```

1822      000006      SP=      %6
1823
1824 010072 012737 010164 000114 MAMF:  MOV      #PARSRV,2,#PARVEC ;SET PARITY INTERRUPT VECTOR
1825 010100 012737 000340 000116      MOV      #340,2,#PARVEC+2 ;AND PRIORITY LEVEL 7 ON INTERRUPT
1826 010106 013746 000004      MOV      2,#ERRVEC,-(SP) ;SAVE CURRENT ERROR VECTOR
1827 010112 013746 000006      MOV      2,#ERRVEC+2,-(SP) ;AND PRIORITY LEVEL
1828 010116 012737 000006 000004      MOV      #ERRVEC+2,2,#ERRVEC
1829 010124 012737 000002 000006      MOV      #RTI,2,#ERRVEC+2
1830 010132 012700 172100      MOV      #PARCSR,%0 ;GET FIRST CSR ADDRESS
1831 010136 012702 000001      MOV      #1,%2
1832 010142 012720 000001 1S:      MOV      #1,(0)+ ;SET ACTION ENABLE IF AVAILABLE
1833 010146 006302      ASL      %2 ;SHIFT AVAILABILITY INDICATOR
1834 010150 103374      BCC      1S
1835 010152 012637 000006      MOV      (SP)+,2,#ERRVEC+2 ;RESTORE ERROR VECTOR
1836 010156 012637 000004      MOV      (SP)+,2,#ERRVEC ;PRIORITY LEVEL AND INTERRUPT VECTOR
1837 010162 000207      RTS      %7
1838
1839 ;PARITY ERROR SERVICE ROUTINE
1840 ;WHEN A PARITY ERROR IS DETECTED THE ROUTINE SCANS
1841 ;MEMORY FOR THE PARITY ERROR. WHEN THE ERROR
1842 ;IS DETECTED THE PROGRAM HALTS WITH THE ADDRESS
1843 ;CAUSING THE ERROR IN RO
1844 ;TO CONTINUE PRESS CONTINUE
1845
1846 010164 104001      PARSRV: EMT+1
1847 010166 010724      PARERR
1848 010170 012737 010216 000114      MOV      #2S,2,#PARVEC ;REPOSITION PARITY ERROR INT.
1849 010176 012737 010244 000004      MOV      #4S,2,#ERRVEC ;SET TIME OUT TRAP
1850 010204 005037 000006      CLR      2,#ERRVEC+2
1851 010210 005000      CLR      %0
1852 010212 005720 1S:      TST      (0)+ ;SCAN MEMORY
1853 010214 000776      BR       1S
1854 010216 000000 2S:      HALT      ;PARITY ERROR - ADDRESS
1855 ;CAUSING ERROR IS IN REGISTER 0
1856 010220 000005 3S:      RESET
1857 010222 012737 010164 000114      MOV      #PARSRV,2,#PARVEC ;RESTORE PARITY VECTOR
1858 010230 012737 000006 000004      MOV      #ERRVEC+2,2,#ERRVEC ;RESTORE TIME OUT HALT
1859 010236 004767 177630      JSR      %7,MAMF
1860 010242 000002      RTI
1861 010244 000000 4S:      HALT      ;ERROR - PARITY ERROR NOT DETECTED ON SCAN
1862 010246 000764      BR       3S ;4(SP) CONTAINS PC WHERE
1863 ;PARITY ERROR WAS ORIGINALLY DETECTED
1864
1865 010250 016703 170570      INCTAB: MOV      FLAG,%3
1866 010254 042703 177763      BIC      #177763,%3 ;MASK DRIVE NO
1867 010260 000241      CLC
1868 010262 006003      ROR      %3 ;NORMALIZE
1869 010264 005263 010272      INC      TABLE(3) ;INCREMENT ERROR COUNT
1870 010270 000207      RTS      %7
1871 010272 000000      TABLE: 0 ;ERROR COUNT DRIVE 0
1872 010274 000000      0 ;ERROR COUNT DRIVE 1
1873 010276 000000      0 ;ERROR COUNT DRIVE 2
1874 010300 000000      0 ;ERROR COUNT DRIVE 3

```

|      |        |        |        |        |                                       |
|------|--------|--------|--------|--------|---------------------------------------|
| 1875 | 010302 | 000000 |        |        | TEXBUF: 0                             |
| 1876 | 010304 | 000000 |        |        | TSTCH: 0                              |
| 1877 |        |        |        |        |                                       |
| 1878 | 010306 | 042045 | 052101 | 020101 | HED1: .ASCII /%DATA ERROR a/          |
| 1879 | 010314 | 051105 | 047522 | 020122 |                                       |
| 1880 | 010322 | 100    |        |        |                                       |
| 1881 | 010323 | 045    | 052123 | 052101 | HED2: .ASCII /%STATUS ERROR a/        |
| 1882 | 010330 | 051525 | 042440 | 051122 |                                       |
| 1883 | 010336 | 051117 | 040040 |        |                                       |
| 1884 | 010342 | 042045 | 044522 | 042526 | HED4: .ASCII /%DRIVE ADDRESS ERROR a/ |
| 1885 | 010350 | 040440 | 042104 | 042522 |                                       |
| 1886 | 010356 | 051523 | 042440 | 051122 |                                       |
| 1887 | 010364 | 051117 | 040040 |        |                                       |
| 1888 | 010370 | 040045 |        |        | HED5A: .ASCII /%a/                    |
| 1889 | 010372 | 042445 | 051122 | 051117 | HED5: .ASCII /%ERROR /                |
| 1890 | 010400 | 040    |        |        |                                       |
| 1891 | 010401 | 000    | 100    |        | HED5X: .BYTE 0,'a                     |
| 1892 | 010403 | 045    | 040522 | 042516 | HED6: .ASCII /%RANEX ERROR a/         |
| 1893 | 010410 | 020130 | 051105 | 047522 |                                       |
| 1894 | 010416 | 020122 | 100    |        |                                       |
| 1895 | 010421 | 040    | 020040 | 020040 | MES0: .ASCII / DMA a/                 |
| 1896 | 010426 | 020040 | 046504 | 020101 |                                       |
| 1897 | 010434 | 100    |        |        |                                       |
| 1898 | 010435 | 040    | 020040 | 020040 | MES1: .ASCII / RCDA a/                |
| 1899 | 010442 | 020040 | 041522 | 040504 |                                       |
| 1900 | 010450 | 040040 |        |        |                                       |
| 1901 | 010452 | 020040 | 020040 | 020040 | MES1A: .ASCII / RCER a/               |
| 1902 | 010460 | 051040 | 042503 | 020122 |                                       |
| 1903 | 010466 | 100    |        |        |                                       |
| 1904 | 010467 | 040    | 020040 | 020040 | MES2: .ASCII / RCCS a/                |
| 1905 | 010474 | 020040 | 041522 | 051503 |                                       |
| 1906 | 010502 | 040040 |        |        |                                       |
| 1907 | 010504 | 020040 | 020040 | 020040 | MES2A: .ASCII / RCLA a/               |
| 1908 | 010512 | 051040 | 046103 | 020101 |                                       |
| 1909 | 010520 | 100    |        |        |                                       |
| 1910 | 010521 | 040    | 020040 | 020040 | MES3: .ASCII / WORD COUNTa/           |
| 1911 | 010526 | 020040 | 047527 | 042122 |                                       |
| 1912 | 010534 | 041440 | 052517 | 052116 |                                       |
| 1913 | 010542 | 100    |        |        |                                       |
| 1914 | 010543 | 040    | 020040 | 047527 | MES4: .ASCII / WORD ADR.a/            |
| 1915 | 010550 | 042122 | 040440 | 051104 |                                       |
| 1916 | 010556 | 040056 |        |        |                                       |
| 1917 | 010560 | 020040 | 040    |        | MES5: .ASCII / / / / / /              |
| 1918 | 010563 | 000    | 000    | 000    | MES5X: .BYTE 0,0,0,0,0,0,'a           |
| 1919 | 010566 | 000    | 000    | 000    |                                       |
| 1920 | 010571 | 100    |        |        |                                       |
| 1921 | 010572 | 020040 | 040    |        | MES6: .ASCII / / / / / /              |
| 1922 | 010575 | 000    | 000    | 000    | MES6X: .BYTE 0,0,0,0,0,0,'a           |
| 1923 | 010600 | 000    | 000    | 000    |                                       |
| 1924 | 010603 | 100    |        |        |                                       |
| 1925 | 010604 | 040077 |        |        | MES7: .ASCII /?a/                     |
| 1926 | 010606 | 040057 |        |        | MES8: .ASCII /'a/                     |
| 1927 | 010610 | 052445 | 044516 | 020124 | MES11: .ASCII /%UNIT NO.a/            |
| 1928 | 010616 | 047516 | 040056 |        |                                       |
| 1929 | 010622 | 020040 | 100    |        | MES12: .ASCII / a/                    |
| 1930 | 010625 | 040    | 051040 | 040505 | MES13: .ASCII / READ a/               |

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RC11 DATA TEST REPLACES D5JA-PB2/DZRCB-A

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|      |        |        |        |        |   |
|------|--------|--------|--------|--------|---|
| 1931 | 010632 | 020104 | 100    |        |   |
| 1932 | 010635 | 045    | 045517 | 040041 | OK: .ASCII "%OK!?"                                |
| 1933 | 010642 | 050045 | 047522 | 042503 | TIMO: .ASCII "/%PROCESSOR BACKGROUND TIMED OUT?/" |
| 1934 | 010650 | 051523 | 051117 | 041040 |   |
| 1935 | 010656 | 041501 | 043513 | 047522 |   |
| 1936 | 010664 | 047125 | 020104 | 044524 |   |
| 1937 | 010672 | 042515 | 020104 | 052517 |   |
| 1938 | 010700 | 040124 |        |        |   |
| 1939 | 010702 | 050045 | 053517 | 051105 | PWRF: .ASCII "/%POWER HAS FAILED?/"               |
| 1940 | 010710 | 044040 | 051501 | 043040 |   |
| 1941 | 010716 | 044501 | 042514 | 040104 |   |
| 1942 |        |        |        |        |   |
| 1943 | 010724 | 046445 | 046505 | 051117 | PARERR: .ASCII "/%MEMORY PARITY ERROR?/"          |
| 1944 | 010732 | 020131 | 040520 | 044522 |   |
| 1945 | 010740 | 054524 | 042440 | 051122 |   |
| 1946 | 010746 | 051117 | 100    |        |   |
| 1947 | 010751 | 045    | 040504 | 040524 | CON1: .ASCII "/%DATA TEST ONLY? (YES-NO)?/"       |
| 1948 | 010756 | 052040 | 051505 | 020124 |   |
| 1949 | 010764 | 047117 | 054514 | 020077 |   |
| 1950 | 010772 | 054450 | 051505 | 047055 |   |
| 1951 | 011000 | 024517 | 100    |        |   |
| 1952 | 011003 | 045    | 052515 | 052114 | CON2: .ASCII "/%MULTI DRIVE MODE?(YES-NO)?/"      |
| 1953 | 011010 | 020111 | 051104 | 053111 |   |
| 1954 | 011016 | 020105 | 047515 | 042504 |   |
| 1955 | 011024 | 024077 | 042531 | 026523 |   |
| 1956 | 011032 | 047516 | 040051 |        |   |
| 1957 | 011036 | 047045 | 046525 | 042502 | CON3: .ASCII "/%NUMBER OF DRIVES (1 TO 4)?/"      |
| 1958 | 011044 | 020122 | 043117 | 042040 |   |
| 1959 | 011052 | 044522 | 042526 | 020123 |   |
| 1960 | 011060 | 030450 | 052040 | 020117 |   |
| 1961 | 011066 | 024464 | 040077 |        |   |
| 1962 | 011072 | 042445 | 042530 | 041522 | CON4: .ASCII "/%EXERCISE DRIVE?/"                 |
| 1963 | 011100 | 051511 | 020105 | 051104 |   |
| 1964 | 011106 | 053111 | 037505 | 100    |   |
| 1965 | 011113 | 045    | 050117 | 044524 | CON5: .ASCII "/%OPTIONAL WORD COUNT (YES-NO)?/"   |
| 1966 | 011120 | 047117 | 046101 | 053440 |   |
| 1967 | 011126 | 051117 | 020104 | 047503 |   |
| 1968 | 011134 | 047125 | 020124 | 054450 |   |
| 1969 | 011142 | 051505 | 047055 | 024517 |   |
| 1970 | 011150 | 100    |        |        |   |
| 1971 | 011151 | 045    | 042514 | 043516 | CON6: .ASCII "/%LENGTH (1 TO ?)?"                 |
| 1972 | 011156 | 044124 | 024040 | 020061 |   |
| 1973 | 011164 | 047524 | 040040 |        |   |
| 1974 | 011170 | 020040 | 020040 | 020040 | CON6A: .ASCII "/ )?/"                             |
| 1975 | 011176 | 037451 | 100    |        |   |
| 1976 | 011201 | 045    | 052123 | 051101 | CON7: .ASCII "/%STARTING SECTOR?/"                |
| 1977 | 011206 | 044524 | 043516 | 051440 |   |
| 1978 | 011214 | 041505 | 047524 | 037522 |   |
| 1979 | 011222 | 100    |        |        |   |
| 1980 | 011223 | 045    | 040504 | 040524 | CON8: .ASCII "/%DATA PATTERN NO.?/"               |
| 1981 | 011230 | 050040 | 052101 | 042524 |   |
| 1982 | 011236 | 047122 | 047040 | 027117 |   |
| 1983 | 011244 | 040077 |        |        |   |
| 1984 | 011246 | 053445 | 044522 | 042524 | CON9: .ASCII "/%WRITE?(YES-NO)?/"                 |
| 1985 | 011254 | 024077 | 042531 | 026523 |   |
| 1986 | 011262 | 047516 | 040051 |        |   |

|      |        |        |        |        |                |                          |
|------|--------|--------|--------|--------|----------------|--------------------------|
| 1987 | 011266 | 053445 | 044522 | 042524 | CON10: .ASCII  | /%WRITE CHECK?(YES-NO)@/ |
| 1988 | 011274 | 041440 | 042510 | 045503 |                |                          |
| 1989 | 011302 | 024077 | 042531 | 026523 |                |                          |
| 1990 | 011310 | 047516 | 040051 |        |                |                          |
| 1991 | 011314 | 051045 | 040505 | 037504 | CON11: .ASCII  | /%READ?(YES-NO)@/        |
| 1992 | 011322 | 054450 | 051505 | 047055 |                |                          |
| 1993 | 011330 | 024517 | 100    |        |                |                          |
| 1994 | 011333 | 040    | 020040 | 100    | PATMES: .ASCII | / @/                     |
| 1995 | 011337 | 045    | 040520 | 052124 | PATHED: .ASCII | /%PATTERN @/             |
| 1996 | 011344 | 051105 | 020116 | 040040 |                |                          |
| 1997 | 011352 | 042045 | 044522 | 042526 | NODRV: .ASCII  | /%DRIVE ZERO OFF LINE@/  |
| 1998 | 011360 | 055040 | 051105 | 020117 |                |                          |
| 1999 | 011366 | 043117 | 020106 | 044514 |                |                          |
| 2000 | 011374 | 042516 | 100    |        |                |                          |
| 2001 | 011377 | 045    | 020040 | 051104 | RKNUM: .ASCII  | /% DRIVE(S) ON LINE@/    |
| 2002 | 011404 | 053111 | 024105 | 024523 |                |                          |
| 2003 | 011412 | 047440 | 020116 | 044514 |                |                          |
| 2004 | 011420 | 042516 | 100    |        |                |                          |
| 2005 | 011423 | 045    | 047105 | 077504 | END: .ASCII    | /%END/<177>@/            |
| 2006 | 011430 | 100    |        |        |                |                          |
| 2007 |        |        |        |        |                |                          |
| 2008 |        | 011432 |        |        | OUTBUF: .EVEN  |                          |
| 2009 | 011432 | 000000 |        |        | 0              |                          |
| 2010 |        |        |        |        |                |                          |
| 2011 |        | 000001 |        |        | .END           |                          |







|        |        |       |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
|--------|--------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|
| PATHE0 | 011337 | 1995# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PATME0 | 011333 | 1994# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PATNU0 | 001056 | 650#  | 691*  | 799*  | 801*  | 969*  | 970   | 973* | 1279  | 1789* |       |       |       |       |  |  |  |  |  |  |
| PAT0   | 005314 | 1284  | 1324# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT1   | 005316 | 1325# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT10  | 005334 | 1332# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT11  | 005336 | 1333# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT12  | 005340 | 1334# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT13  | 005342 | 1335# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT14  | 005344 | 1336# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT15  | 005346 | 1337# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT16  | 005350 | 1338# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT17  | 005352 | 1339# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT2   | 005320 | 1326# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT20  | 005354 | 1340# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT3   | 005322 | 1327# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT4   | 005324 | 1328# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT5   | 005326 | 1329# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT6   | 005330 | 1330# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PAT7   | 005332 | 1331# |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PFT1   | 007312 | 606   | 1684# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PFT2   | 007546 | 607   | 1749# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PFWAT  | 007322 | 1686# | 1688  | 1700  | 1716  |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PWFAL  | 007716 | 1685  | 1750  | 1787# | 1796  |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PRIORI | 001042 | 641#  | 925   | 941   | 962   | 982   | 998   | 1005 | 1013  | 1696  | 1712  | 1761  | 1802  | 1809  |  |  |  |  |  |  |
| PS     | 001002 | 621#  | 684*  | 914*  | 925*  | 934*  | 941*  | 956* | 962*  | 982*  | 998*  | 1005* | 1013* | 1410* |  |  |  |  |  |  |
|        |        | 1638# | 1696* | 1712* | 1761* | 1802* | 1809* |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PWRDN  | 007646 | 1754  | 1768# | 1772  |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PWRF   | 010702 | 1732  | 1939# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PWRFL  | 007556 | 1751# | 1753  | 1765  | 1778  |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| PWRUP  | 007664 | 1769  | 1772# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RANDOM | 005162 | 985   | 991   | 1283  | 1290# | 1318  |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RANER  | 003442 | 979   | 1016# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RANEX  | 003172 | 601   | 976#  | 1036  |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RANNU  | 001046 | 646#  |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCBA   | 001026 | 634#  | 1499* |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCCS   | 001022 | 632#  | 698   | 865   | 867   | 870   | 878   | 880  | 882   | 1095  | 1107  | 1126  | 1133  | 1148* |  |  |  |  |  |  |
|        |        | 1501* | 1502  | 1721* | 1768* |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCDA   | 001030 | 635#  | 703*  | 723*  | 883   | 1074  | 1117  | 1199 | 1205  | 1254* | 1498* |       |       |       |  |  |  |  |  |  |
| RCDB   | 001034 | 637#  |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCER   | 001020 | 631#  | 1100  |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCLA   | 001016 | 630#  |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCMR   | 001032 | 636#  |       |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCNOV  | 001352 | 699   | 701   | 705#  |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RCWC   | 001024 | 633#  | 1140  | 1500* |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RDSECT | 002414 | 877#  | 886   | 903   |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RDWAIT | 002770 | 938   | 941#  |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| READ = | 104405 | 592#  | 877   | 936   | 1008  |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| REDA   | 004120 | 1108  | 1117# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| REPDRV | 001366 | 706   | 710#  |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| REPOEN | 003640 | 1044  | 1048  | 1058# |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RKNUM  | 011377 | 712   | 716   | 2001# |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RORBLK | 005064 | 1261  | 1265# |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| RTIX   | 006262 | 1452  | 1456* | 1478# |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| SANHT  | 002472 | 889#  | 893   |       |       |       |       |      |       |       |       |       |       |       |  |  |  |  |  |  |
| SAVE   | 001072 | 656#  | 852*  | 904   | 1351* | 1353  | 1363* | 1376 | 1411* | 1414* | 1415  | 1419* | 1420  | 1421  |  |  |  |  |  |  |



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MAINDEC-11-DZRCB-B  
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RC11 DATA TEST REPLACES D5JA-PB2/DZRCB-A  
CROSS REFERENCE TABLE -- USER SYMBOLS

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|         |          |        |       |       |       |       |       |       |       |       |       |       |       |       |
|---------|----------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|         |          | 1100*  | 1102  | 1109* | 1110* | 1112  | 1117* | 1119  | 1126* | 1128  | 1167* | 1168* | 1170* | 1171* |
|         |          | 1172*  | 1173* | 1174* | 1175* | 1176  | 1205* | 1207  | 1230* | 1232  | 1234* | 1250* | 1251* | 1252* |
|         |          | 1253*  | 1254  | 1259* | 1260  | 1262* | 1264* | 1266* | 1267* | 1268* | 1269* | 1270* | 1271  | 1280* |
|         |          | 1285*  | 1313* | 1317* | 1349* | 1361* | 1369  | 1490* | 1492* | 1493* | 1494* | 1495* | 1496* | 1497* |
|         |          | 1498   | 1510  | 1527  | 1662* | 1663* | 1670  | 1727* | 1729* | 1774* | 1776* |       |       |       |
| WORK1   | 001114   | 668#   | 883*  | 995*  | 1186* | 1235* | 1348* | 1356* | 1359  | 1362* | 1373  | 1487* | 1489* | 1490  |
|         |          | 1531   |       |       |       |       |       |       |       |       |       |       |       |       |
| WORK2   | 001116   | 669#   | 1229* | 1231* | 1238  | 1347* | 1355* | 1357  | 1488* | 1504  |       |       |       |       |
| WORK3   | 001120   | 670#   | 1193* | 1194* | 1195* | 1196* | 1197* | 1198* | 1199  | 1202  |       |       |       |       |
| WRCHC=  | 104407   | 591#   | 957   | 1000  | 1707  | 1756  | 1804  |       |       |       |       |       |       |       |
| WRDCMP  | 005416   | 1353#  | 1365  |       |       |       |       |       |       |       |       |       |       |       |
| WRDCT   | 001050   | 647#   | 692*  | 783*  | 855*  | 860   | 910*  | 988*  | 989   | 1024  | 1082  | 1227* | 1238* | 1240* |
|         |          | 1241*  | 1242* | 1243* | 1244* | 1259  | 1280  | 1357  | 1435* | 1439* | 1440* | 1793* |       |       |
| WRDINC  | 005426   | 1355#  | 1403  |       |       |       |       |       |       |       |       |       |       |       |
| WRDNW   | 010000   | 1797#  | 1812  |       |       |       |       |       |       |       |       |       |       |       |
| WRITE = | 104403   | 590#   | 864   | 920   | 993   | 1691  | 1797  |       |       |       |       |       |       |       |
| WRLG    | 003242   | 983#   | 1033  |       |       |       |       |       |       |       |       |       |       |       |
| WRNEXB  | 002374   | 868    | 873#  |       |       |       |       |       |       |       |       |       |       |       |
| WRWAIT  | 002672   | 922    | 925#  |       |       |       |       |       |       |       |       |       |       |       |
| XESH    | 003124   | 961    | 964#  |       |       |       |       |       |       |       |       |       |       |       |
| XINCSE  | 004670   | 1231#  | 1236  |       |       |       |       |       |       |       |       |       |       |       |
| XINCSU  | 004720   | 1233   | 1238# |       |       |       |       |       |       |       |       |       |       |       |
| XINCH   | 006222   | 1465#* | 1466  | 1467  | 1470  |       |       |       |       |       |       |       |       |       |
| XSEABU  | 002324   | 861#   | 863   |       |       |       |       |       |       |       |       |       |       |       |
| XSLH    | 002702   | 924    | 927#  |       |       |       |       |       |       |       |       |       |       |       |
| XTIMCN  | 007704   | 1775#  | 1777  |       |       |       |       |       |       |       |       |       |       |       |
| XWAIT   | 006134   | 685    | 1452# |       |       |       |       |       |       |       |       |       |       |       |
| .       | = 011434 | 593#   | 594#  | 596#  | 605#  | 617#  | 733   | 840   | 866   | 879   | 906   | 967   | 971   | 995   |
|         |          | 997    | 1002  | 1004  | 1010  | 1012  | 1035  | 1096  | 1137  | 1143  | 1146  | 1152  | 1155  | 1165  |
|         |          | 1183   | 1218  | 1401  | 1462  | 1469  | 1503  | 1545  | 1578  | 1644  | 1655  | 1693  | 1695  | 1709  |
|         |          | 1711   | 1758  | 1760  | 1799  | 1801  | 1806  | 1808  | 2009# |       |       |       |       |       |

F05

MAINDEC-11-DZRCB-B RC11 DATA TEST REPLACES DSJA-PB2/DZRCB-A  
DZRCBB.P11 CROSS REFERENCE TABLE -- MACRO NAMES

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ERROR 616# 869 884 897

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ADC  | 1300 | 1302 | 1304 | 1305 | 1307 | 1310 |      |      |      |      |      |      |      |      |      |
| ADD  | 702  | 703  | 969  | 1054 | 1056 | 1197 | 1225 | 1264 | 1299 | 1301 | 1303 | 1306 | 1308 | 1309 | 1363 |
|      | 1364 | 1423 | 1438 | 1560 | 1597 | 1618 | 1621 | 1670 |      |      |      |      |      |      |      |
| ASL  | 1294 | 1833 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| BCC  | 1834 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| BEQ  | 701  | 777  | 797  | 826  | 840  | 906  | 918  | 931  | 954  | 971  | 1017 | 1035 | 1044 | 1048 | 1062 |
|      | 1134 | 1137 | 1141 | 1143 | 1146 | 1152 | 1183 | 1189 | 1191 | 1200 | 1218 | 1233 | 1261 | 1283 | 1314 |
|      | 1358 | 1360 | 1401 | 1412 | 1422 | 1469 | 1545 | 1569 | 1571 | 1583 |      |      |      |      |      |
| BHI  | 1053 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| BIC  | 802  | 832  | 933  | 947  | 978  | 987  | 1018 | 1046 | 1060 | 1079 | 1086 | 1110 | 1168 | 1196 | 1198 |
|      | 1226 | 1253 | 1262 | 1387 | 1436 | 1440 | 1489 | 1620 | 1623 | 1649 | 1663 | 1866 |      |      |      |
| BIS  | 696  | 722  | 734  | 740  | 759  | 798  | 809  | 816  | 823  | 1080 | 1099 | 1148 | 1176 | 1245 | 1254 |
|      | 1367 | 1721 | 1768 |      |      |      |      |      |      |      |      |      |      |      |      |
| BIT  | 698  | 825  | 839  | 905  | 917  | 921  | 930  | 937  | 943  | 953  | 958  | 994  | 1001 | 1009 | 1016 |
|      | 1034 | 1043 | 1107 | 1133 | 1136 | 1142 | 1145 | 1151 | 1154 | 1164 | 1182 | 1217 | 1260 | 1359 | 1400 |
|      | 1544 | 1574 | 1657 | 1692 | 1708 | 1757 | 1798 | 1805 |      |      |      |      |      |      |      |
| BLOS | 746  | 755  | 781  | 789  | 795  |      |      |      |      |      |      |      |      |      |      |
| BMI  | 695  | 1096 | 1413 | 1416 |      |      |      |      |      |      |      |      |      |      |      |
| BNE  | 676  | 699  | 706  | 733  | 739  | 765  | 808  | 815  | 822  | 863  | 890  | 893  | 922  | 938  | 944  |
|      | 949  | 959  | 995  | 1002 | 1010 | 1033 | 1108 | 1155 | 1165 | 1236 | 1286 | 1298 | 1318 | 1354 | 1505 |
|      | 1555 | 1564 | 1575 | 1580 | 1600 | 1628 | 1646 | 1655 | 1658 | 1693 | 1709 | 1730 | 1758 | 1777 | 1799 |
|      | 1806 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| BPL  | 866  | 868  | 879  | 881  | 967  | 1223 | 1467 | 1503 | 1578 | 1641 | 1644 |      |      |      |      |
| BR   | 704  | 750  | 872  | 874  | 886  | 894  | 903  | 924  | 928  | 940  | 951  | 961  | 965  | 997  | 1004 |
|      | 1012 | 1055 | 1057 | 1192 | 1228 | 1237 | 1365 | 1403 | 1424 | 1426 | 1457 | 1470 | 1506 | 1522 | 1556 |
|      | 1573 | 1586 | 1592 | 1604 | 1636 | 1653 | 1661 | 1671 | 1695 | 1699 | 1700 | 1711 | 1715 | 1760 | 1764 |
|      | 1765 | 1778 | 1801 | 1808 | 1812 | 1853 | 1862 |      |      |      |      |      |      |      |      |
| CLC  | 756  | 800  | 1050 | 1169 | 1239 | 1265 | 1442 | 1491 | 1664 | 1666 | 1668 | 1867 |      |      |      |
| CLR  | 674  | 686  | 689  | 690  | 691  | 697  | 723  | 858  | 875  | 908  | 973  | 1042 | 1092 | 1216 | 1224 |
|      | 1229 | 1293 | 1347 | 1348 | 1362 | 1432 | 1453 | 1460 | 1464 | 1472 | 1565 | 1639 | 1686 | 1687 | 1704 |
|      | 1705 | 1751 | 1752 | 1790 | 1791 | 1850 | 1851 |      |      |      |      |      |      |      |      |
| CMP  | 700  | 732  | 738  | 745  | 754  | 764  | 780  | 788  | 794  | 796  | 807  | 814  | 821  | 889  | 948  |
|      | 970  | 1047 | 1052 | 1188 | 1199 | 1232 | 1282 | 1353 | 1357 | 1415 | 1421 | 1458 | 1504 | 1554 | 1599 |
|      | 1645 | 1654 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| CMPB | 1563 | 1568 | 1570 | 1579 |      |      |      |      |      |      |      |      |      |      |      |
| DEC  | 675  | 862  | 892  | 1190 | 1235 | 1285 | 1297 | 1313 | 1317 | 1584 | 1627 |      |      |      |      |
| EMT  | 707  | 714  | 729  | 735  | 741  | 751  | 761  | 767  | 773  | 785  | 791  | 804  | 811  | 818  | 827  |
|      | 837  | 1027 | 1058 | 1105 | 1115 | 1122 | 1131 | 1210 | 1392 | 1475 | 1517 | 1538 | 1554 | 1602 | 1647 |
|      | 1659 | 1731 | 1813 | 1846 |      |      |      |      |      |      |      |      |      |      |      |
| HALT | 594  | 709  | 1138 | 1147 | 1153 | 1219 | 1402 | 1477 | 1546 | 1723 | 1770 | 1854 | 1861 |      |      |
| INC  | 779  | 935  | 1032 | 1187 | 1231 | 1234 | 1263 | 1355 | 1356 | 1361 | 1465 | 1468 | 1729 | 1776 | 1869 |
| IOT  | 923  | 939  | 960  | 996  | 1003 | 1011 | 1694 | 1710 | 1759 | 1800 | 1807 | 1807 |      |      |      |
| JMP  | 595  | 597  | 598  | 601  | 603  | 606  | 607  | 724  | 841  | 907  | 968  | 972  | 1036 | 1067 | 1097 |
|      | 1139 | 1716 | 1733 | 1815 |      |      |      |      |      |      |      |      |      |      |      |
| JSR  | 678  | 693  | 710  | 731  | 737  | 743  | 753  | 763  | 769  | 775  | 787  | 793  | 806  | 813  | 820  |
|      | 833  | 853  | 871  | 873  | 885  | 898  | 902  | 915  | 916  | 927  | 929  | 945  | 950  | 952  | 964  |
|      | 985  | 991  | 1015 | 1019 | 1023 | 1063 | 1098 | 1101 | 1111 | 1118 | 1127 | 1185 | 1201 | 1206 | 1215 |
|      | 1368 | 1372 | 1377 | 1382 | 1388 | 1441 | 1509 | 1513 | 1521 | 1526 | 1530 | 1534 | 1543 | 1566 | 1572 |
|      | 1589 | 1591 | 1685 | 1698 | 1714 | 1750 | 1763 | 1794 | 1811 | 1859 |      |      |      |      |      |
| MOV  | 672  | 673  | 677  | 679  | 680  | 681  | 682  | 683  | 684  | 685  | 687  | 688  | 692  | 718  | 747  |
|      | 778  | 782  | 783  | 790  | 799  | 829  | 852  | 854  | 855  | 856  | 857  | 859  | 860  | 861  | 869  |
|      | 870  | 876  | 882  | 883  | 884  | 887  | 888  | 895  | 896  | 897  | 904  | 910  | 911  | 912  | 913  |
|      | 914  | 919  | 925  | 932  | 934  | 941  | 946  | 955  | 956  | 962  | 976  | 977  | 979  | 980  | 981  |
|      | 982  | 983  | 984  | 986  | 988  | 989  | 990  | 992  | 998  | 1005 | 1007 | 1013 | 1045 | 1049 | 1061 |
|      | 1074 | 1075 | 1076 | 1081 | 1082 | 1084 | 1085 | 1087 | 1093 | 1100 | 1109 | 1117 | 1126 | 1135 | 1156 |
|      | 1167 | 1186 | 1193 | 1205 | 1227 | 1230 | 1238 | 1250 | 1258 | 1259 | 1271 | 1279 | 1280 | 1281 | 1284 |

|        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|        | 1290 | 1291 | 1292 | 1311 | 1312 | 1315 | 1316 | 1349 | 1350 | 1351 | 1352 | 1376 | 1381 | 1386 | 1410 |
|        | 1411 | 1417 | 1418 | 1419 | 1431 | 1435 | 1437 | 1448 | 1452 | 1454 | 1456 | 1459 | 1461 | 1462 | 1473 |
|        | 1487 | 1488 | 1490 | 1498 | 1499 | 1500 | 1501 | 1553 | 1559 | 1561 | 1581 | 1596 | 1598 | 1615 | 1616 |
|        | 1617 | 1619 | 1635 | 1637 | 1638 | 1642 | 1662 | 1684 | 1688 | 1689 | 1690 | 1696 | 1706 | 1712 | 1722 |
|        | 1725 | 1726 | 1727 | 1749 | 1753 | 1754 | 1755 | 1761 | 1769 | 1772 | 1773 | 1774 | 1787 | 1788 | 1789 |
|        | 1792 | 1793 | 1795 | 1796 | 1802 | 1809 | 1824 | 1825 | 1826 | 1827 | 1828 | 1629 | 1830 | 1831 | 1832 |
|        | 1835 | 1836 | 1848 | 1849 | 1857 | 1858 | 1865 |      |      |      |      |      |      |      |      |
| MOVB   | 1562 | 1576 | 1585 | 1588 | 1590 | 1622 |      |      |      |      |      |      |      |      |      |
| NEG    | 1083 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| NOP    | 1064 | 1065 | 1066 |      |      |      |      |      |      |      |      |      |      |      |      |
| RESET  | 671  | 1728 | 1775 | 1856 |      |      |      |      |      |      |      |      |      |      |      |
| ROL    | 720  | 721  | 748  | 749  | 757  | 758  | 801  | 1078 | 1170 | 1171 | 1172 | 1173 | 1174 | 1175 | 1195 |
|        | 1240 | 1241 | 1242 | 1243 | 1244 | 1252 | 1295 | 1296 | 1443 | 1444 | 1445 | 1446 | 1447 | 1492 | 1493 |
|        | 1494 | 1495 | 1496 | 1497 | 1665 | 1667 | 1669 |      |      |      |      |      |      |      |      |
| ROR    | 830  | 831  | 1051 | 1266 | 1267 | 1268 | 1269 | 1270 | 1434 | 1439 | 1624 | 1625 | 1626 | 1650 | 1651 |
|        | 1652 | 1868 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RTI    | 1088 | 1094 | 1149 | 1157 | 1463 | 1474 | 1478 | 1567 | 1601 | 1829 | 1860 |      |      |      |      |
| RTS    | 1166 | 1177 | 1184 | 1220 | 1246 | 1255 | 1272 | 1287 | 1319 | 1366 | 1449 | 1547 | 1587 | 1629 | 1656 |
|        | 1837 | 1870 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| SUB    | 719  | 744  | 1144 | 1414 | 1425 | 1430 | 1433 |      |      |      |      |      |      |      |      |
| SWAB   | 1077 | 1194 | 1251 |      |      |      |      |      |      |      |      |      |      |      |      |
| SXT    | 1455 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| TRAP   | 590  | 591  | 592  |      |      |      |      |      |      |      |      |      |      |      |      |
| TST    | 694  | 705  | 776  | 867  | 880  | 891  | 966  | 1095 | 1140 | 1420 | 1582 | 1852 |      |      |      |
| TSTB   | 865  | 878  | 1222 | 1466 | 1502 | 1577 | 1640 | 1643 |      |      |      |      |      |      |      |
| WAIT   | 926  | 942  | 963  | 999  | 1006 | 1014 | 1697 | 1713 | 1762 | 1803 | 1810 |      |      |      |      |
| .ASCII | 1878 | 1881 | 1884 | 1888 | 1889 | 1892 | 1895 | 1898 | 1901 | 1904 | 1907 | 1910 | 1914 | 1917 | 1921 |
|        | 1925 | 1926 | 1927 | 1929 | 1930 | 1932 | 1933 | 1939 | 1943 | 1947 | 1952 | 1957 | 1962 | 1965 | 1971 |
|        | 1974 | 1976 | 1980 | 1984 | 1987 | 1991 | 1994 | 1995 | 1997 | 2001 | 2005 |      |      |      |      |
| .BYTE  | 1891 | 1918 | 1922 |      |      |      |      |      |      |      |      |      |      |      |      |
| .ENABL | 571  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .END   | 2011 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .EVEN  | 2008 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .LIST  | 550  | 594  | 870  | 885  | 898  |      |      |      |      |      |      |      |      |      |      |
| .MACR  | 616  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .NLIST | 550  | 594  | 870  | 885  | 898  |      |      |      |      |      |      |      |      |      |      |
| .REM   | 1    | 553  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .REPT  | 594  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .TITLE | 549  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

ERRORS DETECTED: 0  
DEFAULT GLOBALS GENERATED: 0

\*DZRCBB, DZRCBB, SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DZRCBB.P11  
RUN-TIME: 5 12 2 SECONDS  
RUN-TIME RATIO: 56/22=2.5  
CORE USED: 8K (15 PAGES)

